EOSDIS CORE SYSTEM
CONTRACT DATA REQUIREMENTS DOCUMENT

June 2, 1994

Revision A

NASA

National Aeronautics and Space Administration

GODDARD SPACE FLIGHT CENTER

GREENBELT, MARYLAND

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Table of Contents

Section 1 — SCOPE

The Contract Data Requirements Document (CDRD) is the basic contractual document which governs all data required by and for the contract. The Contractor shall furnish all data described by the Data Item Descriptions (DIDs) included herein and listed in the Contract Data Requirements List (CDRL). All data shall be prepared, maintained, and delivered to NASA in accordance with the requirements of this CDRD. The CDRD does not specify all of the documents or activities that the Contractor will have to accomplish to meet the objectives of the contract. This CDRD provides the top-level structure for the contract work and lists the reviews and documents of primary importance to the Government. The Contractor is to define the additional documents and reviews which are appropriate for this contract.

Section 2 — CONTENTS OF THE CDRD

The CDRD consists of a Contract Data Requirements List (CDRL) and a set of Data Item Descriptions (DIDs). The CDRL is a list of required ECS contract documents with final version delivery schedule. The DIDs provide a description of the document format, and delivery media. Functional categories are used to segregate and classify related groups of DIDs. The symbols, titles and descriptions shown are used to define the data categories. The categories are defined below:

Symbol	Title: Description
MG	Management: Information used in the overall management of the contracted work or to support NASA's management of the program, including schedules, status reports, and management plans.
SE	System Engineering: The documents listed under this category are intended to be used by Systems Engineering.
VE	Verification: Data associated with the integration, qualification, and validation processes required to verify that the system meets all contractual requirements.
DV	Development: The documents listed under this category are intended to be used by developers.
PA	Performance and Product Assurance: The documents listed under this category are intended to be used for quality assurance.
PP	Presentation Packages: Presentation packages are to be provided by the contractor at reviews.

OP Maintenance and Operations: Data used to plan, support, and accomplish post-acceptance operations of the system including operations procedures and user's guides.

Each category is followed by approval codes of 1, 2, or 3 in the DID number. These codes for different levels of documents are defined below:

1. Documents with approval code 1 are formal contract deliverables which require Government review and approval prior to their acceptance and use. These documents shall be under Contractor Configuration Control Board/Configuration Management Board control. Contractor--approved changes to documents under contractor configuration control are handled in accordance with Class I and Class II change control requirements described in the EOS Configuration Management Plan. CH01
   Class I changes approved by the contractor CCB are forwarded to the Government for final approval and are not to be implemented until contractual direction is received from the Government. Class II changes approved by the contractor configuration control board are implemented under the board's authority.

   CH01

   At the Government option, a few key documents may be designated to be under full Government Configuration Control Board control. All changes to these designated documents require Government CCB approval before they become effective.

   The government will whenever possible adhere to a 45-day timeframe for review and/or approval of the initial submittal and subsequent changes to code 1 documentation. CH01

2. Documents with approval code 2 are contract deliverables which do not require formal Government approval. They must be delivered to the Government for review, and changes may be requested by the Government reviewers. NASA reserves a time-limited right of disapproval (45 days) for the initial submittal. Contractor-approved changes to approval code 2 documents are handled as described in (1) above. CH01

3. Documents with approval code 3 are to be reviewed and controlled by the Contractor. This documentation is delivered to NASA for information only, but is subject to approval as meeting contractual requirements. The Contractor shall provide titles and release dates for these documents to the Government in advance of their publication so that Government personnel can obtain copies.

Section 3 — DOCUMENT FORMATS AND STANDARDS

3.0 Document Format:

The following specification shall be followed in the preparation of documents:

Specification for Document Formats (500-TIP-2110).

The Contractor may submit an alternative document format specification for Government review and approval.

3.1 English Language Usage:

The Contractor shall abide by the following documents for rules governing the use of the English language:

a. Guidelines for English Language Usage (500-TIP-2201)

b. Technical Information Program (TIP) Language Style Bulletins (e.g., TIP Language Style Bulletin No. 1, Use of Acronyms and Abbreviations).

3.2 Engineering Drawings and Other Product Data:

The Contractor shall abide by the following documents for rules governing the use of Engineering Drawings and Other Product Data:

a. Formats and Drawing Practices – GSFC Engineering Standards Design Manual (X-673-64-1D)

b. Content of Product Data – Relevant DID and Standard for Product Data (500-TIP-3109).

3.3 Special Neutral (Vendor Independent) Processing Requirements:

Those deliverables identified in specific DIDs as having to meet neutral file format requirements shall abide by the following:

a. Text files shall include Standard Generalized Mark-up Language (SGML) tags as specified in ISO 8879, Information Processing-Text and Office Systems, SGML and the baseline tag set

provided in MIL-M-28001A.

b. Document Type Definitions (DTDs) and Formatting Output Specification Instances (FOSIs) shall be submitted with each document type (see MIL-M-28001A).

c. Illustrations/Graphics which accompany the text products identified in the CDRD as having to meet reuse requirements shall be prepared in one of the vendor-independent formats given below. The order of preference is as listed.

   1) MIL-D-28003 Computer Graphics Metafile (CGM)
   2) MIL-M-28000 Class I Initial Graphics Exchange Specification (IGES)
   3) MIL-R-28002 Raster Graphics

3.4 Delivery:

Products shall be delivered in accordance with 500-TIP-2601 (Automated interchange of MO&DSD Information) and MIL-STD-1840A (Automated Interchange of Technical Information), as specified in the CDRD.

All final documents shall be delivered in hardcopy form and, upon request, in electronic media (e.g., computer disk, compact disk read-only memory (CDROM)) in accordance with the approved standards. The Contractor shall take all required measures to protect all delivered magnetic media (e.g., disks) from infection from viruses. This protection shall apply regardless of the contents of the delivered disks including, but not limited to, documents, data files, and software. The Contractor shall implement measures to detect, report, and eliminate all viruses found with the full cognizance of appropriate Government personnel. CH13

3.5 Technical Information Processing Software Tools:

The Contractor shall utilize a standard set of commercial-off-the-shelf (COTS) software tools for word processing, illustrations/graphics, and engineering drawings. The Contractor and its subcontractors shall limit the use of software tools to the standard set.

Section 4 — CONTRACT DATA REQUIREMENTS LIST CONTENT

Throughout the performance of the contract, the Contract Data Requirements List (CDRL) is maintained (new entries and deletions made as suthorized) to provide a listing of all defined data requirements of the contract. The CDRL lists the data item number, the title of the data item, a schedule indicating when the item is due (delivery schedule), and a reference to the ECS Statement of Work section in which the item is referenced. The documents will have draft and preliminary versions as necessary for review prior to delivery of final versions. For these preliminary and draft versions, the Contractor shall prepare and maintain the detailed list with scheduled availability dates. Monthly refers to delivery on or before the 15th of the month. Yearly refers to on or before the anniversary of the award of contract.

Section 5 — DATA ITEM DESCRIPTION Content

Each data requirement listed in the CDRL is defined by a Data Item Description (DID). The DID identifies the data item, describes its content, and provides specific format instructions. Each DID includes a DID number, Title, and a Description of the contents expected for each item. Some DIDs include a description of the required format and delivery directions.

Section 6 - Contract Data Requirements List (CDRL)

001	101/MG1	ECS Project Management Plan	200 copies	1 wk prior to PMR	3.1.2.1	
002	102/MG1	ECS Configuration Management Plan	25 copies	1 wk prior to PMR	3.1.5.1, 3.8.1.3, 3.8.3.2.1, 3.8.3.2.3	
003	103/MG3	ECS Configuration Management Procedures	200 copies	4 months after PMR	3.1.5.1, 3.8.1.3	
004	104/MG1	ECS Data Management Plan	25 copies	1 wk prior to PMR	3.1.5.2	
005	105/MG3	ECS Data Management Procedures	200 copies	2 months after PMR	3.1.5.2	
006	106/MG1	Schedule Management Plan	25 copies	1 week prior to PMR	3.1.5.2	
007	107/MG2	Level 1 Master Schedule	3 copies	Monthly	N/A (TIP req't)	
008	108/MG3	Intermediate Logic Network Diagrams	3 copies	Monthly	N/A (TIP req't)	
009	109/MG3	Performance Measurement Status Reports	25 copies	monthly	3.1.3	
010	110/MG2	Procurement Management Plan	25 copies	1 wk prior to PMR	3.1.4	
011	111/MG3	Monthly Progress Reports	25 copies	monthly	3.1.2.2	
012	112/MG3	Milestone Monitoring	3 copies	monthly	3.1.5.2 & WBS H/B	
013	113/MG3	Intermediate Bar Charts	3 copies	as requested by government up to monthly	3.1.5.2 & WBS H/B	CH03
014	114/MG3	Tabular Reports	3 copies	as requested by government up to monthly	3.1.5.2 & WBS H/B	CH03
015	115/MG3	90-Day Window Report	3 copies	monthly	3.1.5.2 & WBS H/B	

016	116/MG3	Work Packages / Scheduling Sys Cross Ref Guide	3 copies	monthly	3.1.5.2 & WBS H/B
017	117/MG3	End Item Float Report	3 copies	monthly	3.1.5.2 & WBS H/B
018	118/MG3	Monthly Analysis	3 copies	monthly	3.1.5.2 & WBS H/B
019	119/MG3	Contractor Cost Reporting – 533 Requirements	25 copies	monthly & quarterly	3.1.5.2
020	120/MG3	Monthly Contractor Manpower Reporting	25 copies	monthly	3.1.5.2
021	201/SE1	ECS Systems Engineering Plan	25 copies	1 wk prior to PMR	3.2.2.1
022	202/SE1	ECS Standards & Procedures	200 copies	1 month prior to SRR	3.2.1.2
024	204/SE3	Annual Capabilities, Requirements, & Technology Report	200 copies	CRR -2 weeks	3.8.3.5, 3.2.2.1
025	205/SE1	Science User's Guide & Ops Procedures Handbook	200 copies	Vol. 4 (D) SRR - 1month; (F) SDR; Vol. 1-3 (D) CDR - 1 month (F) each release - 4 months	3.8.3.4.2
026	206/SE2	Version 0 Analysis Report (Contractor Analysis of Version 0)	200 copies	SDR -2 weeks, PDR/IDR - 2 weeks	3.2.3.1
027	207/SE1	ECS System Design Specification	200 copies	SDR -2 weeks	3.3, 3.3.3.2, 3.2.3.1
028	208/SE1	Methodology for Definition of External Interfaces	25 copies	1 month prior to SRR	3.2.3.5
029	209/SE1 (F), 209/SE2 (P)	External Interface Control Documents (ICDs)	25 copies each external interface	CDR -2 weeks (F), PDR/IDR - 2 weeks (P)	3.2.3.5

030	210/SE3	Risk Assessment Report	200 copies	PDR/IDR -2 weeks	3.3.2.5, 3.2.4	
031	211/SE3	Trade-off Studies Analytical Data	200 copies	PDR/IDR -2 weeks	3.2.3.1	
033	213/SE2	ECS Life Cycle Cost Report	25 copies	yearly	3.2.5	
034	214/SE1	ECS Security Plan	25 copies	PDR + 4 months	3.2.4	
035	215/SE3	Security Risk Analysis Report	25 copies	PDR/IDR +2 Months	3.2.4	
036	216/SE1	ECS Requirements Specification	200 copies	1 month prior to SRR	3.2.1, 3.2.1.1	
038	218/SE3	Project Development History	25 copies	yearly	3.2.2.1	
039	219/SE2 (P), 219/SE1 (F)	Interface Requirements Documents	25 copies each version & external interface	Per The System Implementation Plan when approved	3.2.3.5	
040	223/SE1	ECS External Data Traffic Requirements	25 copies	Quarterly starting with 1st delivery on January 1, 1996	1.7, 3.2.1.1	CH12
041	221/SE2	CRR Input Materials	100 copies	CRR-2 weeks	2.4.1	
042	301/DV1	ECS System Implementation Plan	200 copies	1 wk prior to PMR, 1 wk prior to SRR	1.3, 3.2.2.2, 3.4.5	
043	302/DV1 (P) 302/DV2 (F)	ECS Facilities Plan	200 copies	SDR -2 weeks (P) CDR -2 weeks (F)	3.2.2.2	
045	304/DV1	Segment Requirements Specification	25 copies each Specification	PDR/IDR -2 weeks	3.3.2.2	
046	305/DV3 (P) 305/DV2 (F) 305/DV2 (U/D)	Segment/ Design Specifications	25 copies each Specification	PDR/IDR -2 weeks (P) CDR -2 weeks (F) RRR -2 weeks (U/D)	3.3.2.3	
048	307/DV2	Segment/Element Release Plans	25 copies each plan	PDR/IDR -2 weeks	3.3.2.1	

049	308/DV2	Software Development Plan	200 copies	SDR -2 weeks	3.2.2.2
050	311/DV1	Database Design and Database Schema Specifications	25 copies	1 month after PDR/IDR	3.3.2.3
051	313/DV3 (P), 313/DV3 (F)	ECS Internal ICDs	25 copies each ICD & version	PDR/IDR -2 weeks (P); CDR -2 weeks (F)	3.3.2.4
052	317/DV1	Prototyping and Studies Plan	25 copies	SDR+1 month	3.3.3.1
053	318/DV3	Prototyping & Studies Progress Reports	25 copies	monthly	3.3.3.1
054	319/DV1	Segment/Element Integration & Test Plan	25 copies each plan	PDR/IDR -2 weeks	3.3.5
055	322/DV3	Segment/Element Integration & Test Procedures	25 copies each test	TRR	3.3.2.1
056	324/DV3	Segment/Element Integration & Test Reports	25 copies each report	CSR -2 weeks (P) RRR -6 weeks (F)	3.3.5
057	326/DV3	Monthly Tabulation of S/W Errors	25* copies each month	monthly / starting with I&T activities	3.3.5
058	329/DV2	Segment/Element Development Plans	25 copies each plan	PDR/IDR-2 weeks	3.3.2.1
060	331/DV3	Prototyping & Studies Final Report	25 copies	6 months prior to Contract end	3.3.3.1
061	332/DV3	Contractor's Release Experience Report	25* copies	3 months after each Release	3.2.3.1
062	333/DV1	PGS Toolkit Users Guide for the ECS Project	100 copies	(F) SDR -6 months; (U/Ds) each toolkit release	3.5
063	401/VE1	Verification Plan	200 copies	SDR-2 weeks	3.6, 3.7
064	402/VE1	ECS Sys Integration & Test Plan	25 copies each plan	SDR -2 weeks (overview); PDR/IDR -2 weeks (F)	3.6.1, 3.2.2.4

065	403/VE1	Verification Specification	25 copies each specification	PDR/IDR -2 weeks	3.6, 3.7	
066	404/VE1	Procedure for Control of Unscheduled Activities During Verification	200 copies	1 wk prior to CDR	3.6, 3.7	
067	405/VE3	ECS System Integration & Test Report	200 copies	CSR -2 weeks(P), RRR -2weeks(F)	3.6.1	
069	409/VE1	ECS Overall Sys Acceptance Test Plan	25 copies	SDR - 2weeks	3.2.2.4, 3.6.2	
070	411/VE1	ECS Overall System Acceptance Test Procedures	200 copies	3 months prior to RRR	3.6.2	
071	412/VE2	ECS Overall System Acceptance Test Report	200 copies	RRR-2weeks	3.6.1, 3.6.2	
072	413/VE3	Discrepancy Reports	25 copies each report	Monthly starting after first release	3.6.2	
073	414/VE1	ECS Sys Integration & Test Procedures	200 copies	3 months prior to RRR	3.6.1	
074	415/VE1	Acceptance Testing Management Plan	25 copies each report	2 weeks prior to PMR (P); 2 weeks prior to SDR	3.6.2	
076	501/PA1	Performance Assurance Implementation Plan (PAIP)	200 copies	2 weeks prior to SDR	3.7, 3.7.1, 3.7.3, 3.8.1.5	
077	502/PA3	Contractor's Practices & Procedures Referenced in the PAIP	25 copies	2 weeks prior to SDR	3.7, 3.7.1	CH07
078	503/PA3	Performance Assurance Status Report	25 copies	monthly	3.7, 3.7.1, 3.7.2	
079	504/PA1	Data on Previously Designed H/W & S/W	25 copies	2 weeks prior to each CDR	3.7, 3.7.1	CH14

080	505/PA3	Description of Contractor & Subcontractor Audit Programs	25 copies	2 weeks prior to SDR	3.7 (in PAIP)
081	506/PA3	Audit Reports	25 copies	semi-annually	3.7, 3.7.1

082	508/PA1	Responses to Review Team Recommendations & Action Items	25 copies	≈1 month after each review	3.4
083	510/PA1	Summary Reports of Contractor Reviews	25 copies	monthly	N/A (in PASR)
084	511/PA1	Maintainability Demonstration Plan	200 copies	2 weeks prior to CDR, TRR	3.7
085	512/PA1	Maintainability Demonstration Test Plans	25 copies	CSR - 2weeks	3.7
086	513/PA2	Hazard Analyses	25 copies	2 weeks prior to IDR/PDR	3.7
087	514/PA2	Security-Sensitive Items List	25 copies	2 weeks prior to PDR & CDR	3.7
088	515/PA2	Availability Models/Predictions	25 copies	CDR -2 weeks (F), PDR -2 weeks (P)	3.7
089	516/PA2	Reliability Predictions	25 copies	2 weeks prior to. PDR/CDR	3.7
090	517/PA2	Failure Modes & Effect Analyses & Critical Items List	25 copies	PDR/CDR -2 weeks	3.7
091	518/PA3	Maintainability Predictions	25 copies	PDR -2 weeks (P) CDR -2 weeks (F),	3.7
092	519/PA3	Maintainability Demonstration Test Reports	25 copies	within 1 month of demonstration	3.7
093	520/PA2	S/W Critical Items List	25 copies	2 weeks prior to PDR/IDR with updates as required	3.7 CH04
094	521/PA3	S/W Nonconformance Reports (formal)	25 copies	monthly / starting with I&T activities	3.7
095	522/PA2 (P) 522/PA2 (F)	Integration & Inspection Flow Plan	25 copies	PDR -2 weeks, CDR -2 weeks	3.7

096	523/PA1	Contractor Workmanship Procedures Proposed Instead of NASA NHBs	25 copies	1 month prior to SDR as required	3.7

097	524/PA1	New or Critical Processes, Specs, &/or Procedures	25 copies	NLT 2 months prior to request approval date	3.7	
098	525/PA3	Training & Certification Records	25 copies	on-going — available for review on request	3.7	
099	526/PA1	Standard Repair Procedures	25 copies	RRR -1 month	3.7	
100	527/PA1	Request for Waiver	25 copies	as required	3.7	
101	528/PA1	Request for Delegation of MRB Authority to a Supplier	25 copies	NLT 1 month prior to request approval date	3.7	
102	529/PA3	Malfunction/Failure Reports (MRs)	25 copies	monthly	3.7	
103	530/PA1	Closeout Submittal of Malfunction/Failure Reports	25 copies	as required	3.7	
104	531/PA2	S/C Orbital Anomaly Report (SOAR)	25 copies	per DID description	3.7	
105	532/PA1	Environmental Control Plan	25 copies	CDR - 1 month	3.7	
106	533/PA1	Responses to Problem Notices and Alerts	25 copies	as required	3.7	
107	534/PA1	Maintenance Records	25 copies	on-going — available for review on request	3.7	
108	535/PA1	Acceptance Data Package	25 copies	2 weeks after each Release	3.7	
109	601/OP1 (P) 601/OP1 (F)	Maintenance & Operations Management Plan	200 copies	PDR -2 weeks (F) SDR -2 weeks (P)	3.8.1	
110	602/OP1	Property Management Plan	25 copies	1 month after SDR	3.8.1.2	
111	603/OP1	Operational Readiness Plan	200 copies	RRR -2 weeks	3.8.1.5, 3.8.1.5.1, 3.8.1.5.3	
112	604/OP1	ECS Operations Concept Document	25 copies	1 month prior to SRR, RIR and CDR	3.2.2.3	CH10

113	605/OP2	Operations Scenarios (elements)	200 copies	CDR -2 weeks	3.3.2.6
114	607/OP2	Maintenance & Ops Manual	200 copies	CDR -2 weeks	3.8.3.1
115	608/OP1	ECS Operations Plan	200 copies	RIR -2 weeks	3.2.2.3, 3.8.3.1
116	609/OP1	Maintenance & Ops Procedures	200 copies	CSR -2 weeks	3.3.2.6
117	611/OP3	Operator's Manuals	25 copies each manual	CSR -2 weeks	3.8.3.1
118	612/OP3	Programmer's Manuals	25 copies each manual	1 month prior to each Release	3.8.3.1
119	613/OP1 (P), 613/OP1 (F)	COTS Maintenance Plan	25 copies each plan	PDR -2 weeks (P) & CDR -2 weeks (U/D)	3.8.3.2
120	614/OP1	Developed Software Maintenance Plan	100 copies	PDR -2 weeks (P) & CDR -2 weeks (U/D)	3.8.3.2.3
121	615/OP2	Special Maintenance & Test Equipment	25 copies	1 month after PDR/IDR	3.8.3.2.2
122	616/OP2	Integrated Logistics Support Plan	25 copies	SRR - 1 month & each CDR -2 weeks	3.8.2
123	617/OP3	Logistics Support Analysis Plan	25 copies	SRR - 1 month & each PDR -2 weeks	3.8.2
124	618/OP3	Replacement Part List & Spare Parts List	25 copies	each CDR -2 weeks & each RRR -2 weeks	3.8.2
125	619/OP3	Test & Support Equipment Requirements List	25 copies	each CDR -2 weeks & each RRR -2 weeks	3.8.2
127	621/OP1	Maintenance & Ops Transition & Training Plan	25 copies	6 months prior to Contract end	3.8.3

128	622/OP2	ECS Training Plan	200 copies	each PDR -2 weeks & each CDR +1 month	3.8.3.4.2, 3.2.2.3	
129	625/OP3	Training Material	200 copies	each RRR -2 weeks	3.8.3.4.2	
130	626/OP1	M & O Certification Plan	25 copies	each RRR -2 weeks	3.8.3.4.1	
144	627/OP3	Security Risk Management Plan	25* copies	1 month after DID 215/SE3		
131	701/PP3	PMR Presentation Package	200 copies	2 weeks after PMR	N/A	
132	702/PP3	SRR Presentation Package	200 copies	2 weeks after SRR	N/A	
133	703/PP3	SDR Presentation Package	200 copies	2 weeks after SDR	N/A	
134	704/PP3	RRR Presentation Package	200 copies	2 weeks after RRR	N/A	
135	705/PP3	PDR/IDR Presentation Package	25* copies	2 weeks after PDR/IDR	N/A	
136	706/PP3	CDR Presentation Package	25* copies	2 weeks after CDR	N/A	
137	707/PP3	PRR Presentation Package	200 copies	2 weeks after PRR	N/A	
138	708/PP3	ORR Presentation Package	200 copies	2 weeks after ORR	N/A	
139	709/PP3	TRR Presentation Package	200 copies	2 weeks after TRR	N/A	
140	710/PP3	ETR Presentation Package	200 copies	2 weeks after ETR	N/A	
143	714/PP3	CSR Presentation Package	25 copies each pkg.	2 weeks after CSR	2.4.2	CH11
144	222/SE2	COTS Analysis & Modeling Report	5 copies	Tri-annually (April 1, Aug 1, Dec 1)	2.3.3	CH09

An asterisk (*) indicates the number of copies of a document or presentation package which each referenced element or facility is to receive (as opposed to the total number of copies).

ACRONYMS used in this Section.

CDR	Critical Design Review
CSR	Consent to Ship Review
D	Draft
F	Final
NLT	No Later Than
P	Preliminary
PDR	Preliminary Design Review
RRR	Release Readiness Review
SDR	System Design Review
SRR	System Requirements Review
U/D	Update

Section 7 — Data Item Descriptions (DIDs)

1. NUMBER 101/MG1	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE ECS Project Management Plan		4. DATE December 21, 1990

5. DESCRIPTION

Identifies the Contractor's organizational structure, showing relationships and responsibilities for management and technical support through all phases of the contract life cycle. Summarizes how the work of the contract will be subdivided into work units, identifies the mid-level management positions, and describes the management of these work units. Contains sections for each of the major activities included in the SOW, discussing how each will be managed.

The Project Management Plan shall include, as a minimum, the following:

a. ECS Contractor's internal organization structure, staffing plan, manpower loading throughout the contract period, description of work flow through Contractor organization, and projected spending rates.
b. Expanded Contract Work Breakdown Structure (CWBS), as negotiated and approved by the Government.
c. Development schedules, showing major reviews, milestones and deliverables.
d. Earned value progress measurement and reporting plan, including example progress measurement reports and graphs.
e. Plans for subcontracting and management of subcontracted items.
f. Descriptions of all automated project management tools to be used.
g. Monthly reporting plans, showing the format of reports and identifying primary personnel who will present oral reviews.
h. Plans for technical coordination with Government personnel, identifying primary personnel who will attend weekly technical working meetings.
i. Technical approach to system development, including descriptions of the system, baseline configuration, constraints, risks, and testing.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.1.2.1

1. NUMBER 102/MG1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE ECS Configuration Management Plan		4. DATE December 21, 1990

5. DESCRIPTION

Describes the organizational structure of the configuration management organization and the activities to be followed by the organization in identifying baselines and controlling changes to them. Addresses the relationship between Government and Contractor Configuration Control Boards, and procedures which will be used for approving baselines and processing changes to those baselines. Discusses classification of changes, version control, and tools which will be used to support configuration management activities.

The plan shall be structured in a hierarchical manner with the EOS Ground Systems and Operations Project Configuration Control Board (CCB) at the highest level, followed by the ECS Contractor program management CCB, then the ECS Contractor development organization CCBs and M&O CCB, and, finally, non-ECS CCBs (such as CCBs at the distributed processing sites).

The CM Plan will address, as a minimum, the following topics:

a. Control of all defined interfaces, both internal and external, beginning as early as practicable in the system lifetime.
b. Identification of all controlled items including documents, support equipment, facilities, and critical components of these items and the basis on which each is selected for configuration control.
c. Control of hardware and software configuration after it is constructed and debugged.
d. Management of the coordination, processing and administration of configuration change requests (CCRs) within the Contractor's internal organization.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.1.5.1, 3.6.1.3, 3.6.3.2.1, 3.6.3.2.3

1. NUMBER 102/MG1	DATA ITEM DESCRIPTION	
3. TITLE ECS Configuration Management Plan		4. DATE December 21, 1990

5. DESCRIPTION (cont'd)

e. Management of change actions flowing between higher-level and lower-level CCBs, and effects these actions may have on the Contractor's internal organization.
f. Maintenance of the independence of the configuration management team.
g. Conduct of configuration audits.
h. Maintenance of a library of baseline documents, software, and CCRs.
i. Control of all equipment or software modifications, including those required for the maintenance of systems or components of systems and those resulting from modification of system capabilities.
j. The configuration management objectives and their relationship to major program requirements.
k. The organization planned for the management of the configuration program, including the internal interfaces between the configuration management organization and the other elements of the Contractor's organization.
l. The Contractor's plan for interfacing with Government, other ECS Contractors and subcontractors.
m. The plans for controlling system drawings which should, at any point in time, accurately define the design configuration of any item to the lowest level component description.
n. The configuration control system that will assure all proposed engineering changes are fully coordinated, evaluated and resolved in a timely manner, that only authorized changes are incorporated in the system baseline, and that incorporation per requirement is properly verified.
o. The engineering release system for processing of all engineering changes to the drawings and specifications.

6. FORMAT

7. DELIVERY

8. TYPE Document	9. SOW REFERENCE 3.1.5.1, 3.6.1.3, 3.8.3.2.1, 3.8.3.2.3

1. NUMBER 102/MG1	DATA ITEM DESCRIPTION	
3. TITLE ECS Configuration Management Plan		4. DATE December 21, 1990

5. DESCRIPTION (cont'd)

p. The subcontractor control system for extending configuration management to subcontractor/suppliers.
q. The Contractor's system for ensuring continued compliance with configuration management requirements.
r. Management Plans related to status accounting, configuration audits and traceability.

6. FORMAT

7. DELIVERY

8. TYPE	9. SOW REFERENCE
Document	3.1.5.1, 3.6.1.3, 3.8.3.2.1, 3.8.3.2.3

1. NUMBER 103/MG3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Configuration Management Procedures		4. DATE December 21, 1990

5. DESCRIPTION

Describes the specific procedures to be used in implementing the Configuration Management Plan to ensure control of all controlled items including the system baselines and their configuration through status accounting, configuration audits, and traceability back to the ECS Specification or other sources of requirements applicable to this contract. It includes samples of all CM forms and formats of CM status reports, as well as specific responsibilities of all parties involved in Configuration Management.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.1.5.1, 3.8.1.3

1. NUMBER 104/MG1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE ECS Data Management Plan		4. DATE December 21, 1990

5. DESCRIPTION

Identifies the organizational structure of the data management organization and the activities to be used in establishing and maintaining system libraries, records, and other system data. This includes all information required to design, develop, integrate, test, and operate the system. Includes the methodologies of collecting, and maintaining pertinent information, as well as providing that information to the development, integration and test teams as needed. Includes description of processes for controlling document masters, preparing formal document changes, and keeping auditable records of changes. Discusses the interface between this function and the system operational databases which will be utilized to operate the system.

Includes all standards and specifications which must be followed in generating the engineering drawings to be provided on this contract.

The ECS Data Management Plan shall include the Contractor's plan for additional documents beyond those called for in this CDRL, required to adequately document the ECS.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.1.5.2

1. NUMBER 105/MG3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE ECS Data Management Procedures		4. DATE December 21, 1990

5. DESCRIPTION

Describes the steps to be used by the ECS Contractor to implement the ECS Data Management Plan. These steps will describe collecting, maintaining, and controlling all data used in the development of the system. Special emphasis shall be placed on data required by the database administrator to build on-line data files to support all levels of testing.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.1.5.2

1. NUMBER 106/MG1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Schedule Management Plan		4. DATE February 27, 1991

5. DESCRIPTION

The Contractor shall prepare a comprehensive schedule plan, which describes the scheduling system. This plan shall explain/describe the program administrative and the schedule administrative control.

It is the intent of the Government for the Contractor to use the Prestige Software as the mechanism for reporting schedule status. This system has the capability of providing the following:

a. Maintaining the original schedule baseline dates on tabular reports/listings, milestone charts, and networks for comparison with current dates;
b. Relating events/ milestones to the Work Breakdown Structure;
c. Defining the internal relationships between events;
d. Defining the time durations of all tasks such as design, manufacturing, and testing, etc.;
e. Defining the planned start and completion dates for all milestones and events;
f. Defining the slack/float for all subsystems;
g. Defining the impact of early starts or slips on future milestones/events;
h. Providing the status of each subsystem and/or black box by actual and project dates;
i. Providing the status of all major test and integration articles by actual and project dates;
j. Providing the critical path.

The plan shall describe the method used for developing, maintaining, and updating the schedule data base. The Contractor shall explain its procedure for performing internal audits/reviews that insures the scheduling data reported to the Government accurately reflect the work status.

(cont'd)

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Electronic version not required.

8. TYPE Document	9. SOW REFERENCE 3.1.5.2

1. NUMBER 106/MG1	DATA ITEM DESCRIPTION	

5. DESCRIPTION (cont'd)

This plan shall describe the method used to ensure compliance required by GSFC Performance Measurement System (PMS) Handbook, GHB 5112.1, September 23, 1988 for vertical and horizontal traceability. In addition, this plan will explain how the traceability is performed/demonstrated from the work packages to the automated networks.

The Contractor shall explain the configuration of the scheduling system and the method used to summarize data from a number of Intermediate Networks into a Summary Network.

The Contractor will perform an audit to verify that start/completion dates for events reflected on the Summary Network are the same dates as the Intermediate Network's and this also applies to the float/slack. It is understood that this summarization will necessitate obtaining the critical path from the Intermediate Network.

The plan shall establish the 15th calendar date following the close-out period as the due date for the delivery of schedule data. The data produced by the automated scheduling system shall be forwarded to the Government electronically. Manually generated schedule data shall be forwarded by Express Mail.

Network schedules shall be developed at Level 4 for the FOS, SDPS, CSMS, and Systems Maintenance and Operations (SMO). The remaining areas of the contract, Program Management and EOSDIS Systems Assurance, will be reported at Level 3. If a problem area is indicated at a lower level of the WBS, more detailed data will be supplied until the problem is resolved. Functional data will be reported at Level 2 of the WBS.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

8. TYPE Document	9. SOW REFERENCE 3.1.5.2

1. NUMBER 107/MG2	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Summary Schedule		4. DATE February 27, 1991

5. DESCRIPTION

The Contractor shall provide the Government with an automated Network, which will reflect the summary of the Intermediate Networks. This will be accomplished so that the start/completion dates and float/slack days agree with those of the intermediate schedules in such a way that it provides vertical and horizontal traceability throughout the project.

The Summary Network shall include programmatic milestones/events for the overall program including PDR, CDR, and other major review. This schedule shall contain an overview of the entire program from design, manufacturing, integration and test, and hardware/software deliverables through launch.

In addition, the Contractor shall furnish the Government with a manual (art) Summary Chart that reflects the major programmatics in addition to the major designs, fabrications, tests, and assembly and tests. This chart must not exceed 8 1/2"x11" and be suitable for preparing a viewgraph for presentation to various levels of management.

Refs: WBS Handbook GHB 7120.1; PMS Handbook GHB 5112.1, 9/23/88

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Electronic version not required.

8. TYPE Document	9. SOW REFERENCE N/A

1. NUMBER 108/ MG3	DATA ITEM DESCRIPTION	2. QUANTITY 3 copies
3. TITLE Intermediate Logic Network Diagrams		4. DATE February 27, 1991

5. DESCRIPTION

Intermediate Logic Networks shall be developed for each subsystem. These networks shall be geometric layouts of the schedule baseline, and the performance baseline will be compared to the schedule baseline for monitoring the progress of work. These networks will reflect the major events; i.e., design, fabrication, test, and assembly and test. These networks will be of sufficient detail to allow adequate monitoring of the work. Upon request from the Government, the Contractor shall supply the Government with more information from the detail schedules which the Contractor maintains. These detail schedules should be verified with the intermediate schedules at regular intervals to ensure that all changes are rolled-up from lower level (detail) schedules to the intermediate level schedules.

The Performance Measurement System (PMS) requires that vertical traceability can be performed/demonstrated from the Work Breakdown Structure (WBS) element where earned value is taken to the Intermediate Schedules. Horizontal traceability will be performed/demonstrated for those hand-offs from one subsystem to another subsystem.

Each event shall contain the following data:

1. Event number relating to the WBS;
2. Current expected start/completion dates;
3. Number of work days required to complete task;
4. Amount of float/slack in work days;
5. Description of event;
6. Baseline start/completion dates.

Ref: GHB 7120.1 WBS Handbook

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Electronic version not required.

8. TYPE Document	9. SOW REFERENCE N/A

1. NUMBER 109/MG3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Performance Measurement Status Reports		4. DATE December 21, 1990

5. DESCRIPTION

The Contractor shall provide monthly Performance Measurement Status Reports (PMSR) filled out in accordance with the instructions set forth in the Goddard PMS Handbook GHB 5112.1. In addition to the PMS Handbook requirements, the monthly PMSR is to include the following specific requirements:

a. Data reported in the PMSR are to pertain to all authorized work, including both priced and unpriced effort. The level of detail to be reported is Level 4 for FOS, SDPS, CSMS, and SMO. The remaining areas of the contract, Program Management, EOSDIS Systems Engineering, EOSDIS Test and Evaluation, and Product Assurance, will be reported at level 3. If a problem area is indicated at a lower level of the WBS, more detailed data will be supplied until the problem is resolved. Functional data will be reported at Level 2 of the WBS.

b. Specific variance thresholds that require problem analysis will initially be +/- 10% and/or $100,000 at the appropriate WBS reporting level (3 or 4). The specific organizational or functional categories to be reported on formats 2 or 4 are subject to negotiation between the Contractor and the Government. Formats 3 and 4 will use monthly increments for baseline and manpower loading requirements unless otherwise negotiated.

c. Hard copy printouts from the Contractor's internal mechanized reporting systems may be substituted for PMSR formats provided the printouts contain all the required data elements at the specified reporting levels in a form suitable for GSFC management use.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.1.3

1. NUMBER 110/MG2	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Procurement Management Plan		4. DATE December 21, 1990

5. DESCRIPTION

Describes the functions and activities necessary for the prime contractor to manage the subcontractor tasks.

Documents the selection, procurement, and management of subcontractor efforts — subcontractor-developed components shall be managed and reported in a manner identical to components developed by the prime contractor. Specifies procedures to be followed in preparing procurement documentation, managing the competition or selection of the vendor, debriefing losing vendors, executing the procurement, maintaining traceability of subcontractor data, and evaluating and accepting the vendor product.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.1.4

1. NUMBER 111/MG3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Monthly Progress Reports		4. DATE December 21, 1990

5. DESCRIPTION

The Monthly Progress Report provides a means for the ECS Project to appraise contract performance, progress, and current program status. It defines the Contractor's program status including technical, schedule status, variance analysis and narrative reports.

Material to be reported monthly covers all technical, schedule related, and resource aspects of the program. Emphasis is to be placed on the accomplishments for the concluded reporting period, the planned activity for the next reporting period, and the identification and resolution of all issues and problems. The monthly reports and oral reviews will, at a minimum, address the following:

a. Measurable progress in all areas of effort, including Contractor responses to user comments and requests.
b. Problems and delays encountered, with a description of causes, remedies, and impacts to cost, schedule and technical performance.
c. Areas of concern that could lead to future problems or delays, with recommended action.
d. Status of personnel and work assignments, including staffing and scheduling changes.
e. Updated, detailed milestone charts indicating past and projected slips of all deliverables.
f. Review of the status of all open action items.
g. List of required documents, with dates of planned delivery, summary of items actually delivered during the reporting period, and status of any items which are behind schedule.

Required by GSFC 42-05-03, ¶1.6.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.1.2.2

1. NUMBER 111/MG3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Monthly Progress Reports		4. DATE December 21, 1990

5. DESCRIPTION (cont'd)

h. Forecast of activities which will continue, be undertaken, or completed within the next reporting period including a schedule of all reviews planned for the upcoming period. This schedule shall include, in addition to the contractually required reviews, a notice of other reviews involving design and test at the unit level and above as well as Failure Review Boards whether by the prime or subcontractors.
i Documentation Delivery Status Report
j. CCB Monthly Reports
k. Review Minutes, Comments, and Contractor Response Plan Report

The schedules should be correlated with cost data for each element of the WBS. The lower level schedules shall be summarized in higher level master schedules. NASA will require additional depth in detail, schedule visibility and frequency of reporting when potential or suspected problems exist.

A summary analysis, including graphical displays as appropriate, which integrates the status of the technical performance and schedule shall be provided for any significant variance at the selected level and any other problem which may not impact the program financially, but which does significantly impact the technical performance, schedule or other aspects of the program. The following information shall be included:

a. Nature of the variance (technical performance, or schedule).
b. Reason for variance.
c. Impact on immediate task.
d. Impact on total program.
e. Corrective action, what, when, by whom, expected effect.

6. FORMAT

7. DELIVERY

8. TYPE Document	9. SOW REFERENCE 3.1.2.2

1. NUMBER 111/MG3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Monthly Progress Reports		4. DATE December 21, 1990

5. DESCRIPTION (cont'd)

Monthly reports that cover the status of items such as those listed below as well as those discussed in the individual sections of the ECS Performance Assurance Requirements (PAR) Document (may be included as a section of DID 111/MG3):

a. Key organization and personnel changes;
b. Significant assurance problems;
c. Safety issues;
d. Inspection and test activities;
e. Procurements and subcontract assurance programs;
f. Audit reports;
g. Contractor reviews;
h. Alert surveys;
i. Results of Trend Analyses;
j. Operating failures (by equipment, and failure frequency information);
k. Repair/replacement maintenance events;
l. Unavailability of required spares and attendant delays;
m. Significant operations or maintenance problems.

6. FORMAT

7. DELIVERY

8. TYPE Document	9. SOW REFERENCE 3.1.2.2

1. NUMBER 112/MG3	DATA ITEM DESCRIPTION	2. QUANTITY 3 copies
3. TITLE Milestone Monitoring		4. DATE February 27, 1991

5. DESCRIPTION

The Contractor shall prepare a list of milestones that are to be accomplished. This listing shall reflect the milestone, baseline date, and current expected or revised date for accomplishment. This data will be updated to include the selection of additional milestones as the rolling wave process breaks the planning packages into work package elements.

In addition the Contractor shall use the above data to prepare an X-Y chart. This chart will portray actual performance vs. baseline performance. A separate listing shall be prepared that reflects all missed milestones for the current reporting month along with missed milestones from the previous month that are not complete. The reason for each missed milestone should be explained along with an impact statement and recovery date.

Ref: GHB 7120.1 WBS Handbook

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Electronic version not required.

8. TYPE Document	9. SOW REFERENCE 3.1.5.2

1. NUMBER 113/MG3	DATA ITEM DESCRIPTION	2. QUANTITY 3 copies
3. TITLE Intermediate Bar Charts		4. DATE February 27, 1991

5. DESCRIPTION

The information contained in the Intermediate Logic Network Diagrams shall also be furnished on 8 1/2" x 11" bar chart format. Automated scheduling systems have the capability of providing both logic networks and bar charts.

These bar charts are not required to show the interrelationship between events.

Ref: GHB 7120.1 WBS Handbook

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Electronic version not required.

8. TYPE Document	9. SOW REFERENCE 3.1.5.2

1. NUMBER 114/MG3	DATA ITEM DESCRIPTION	2. QUANTITY 3 copies
3. TITLE Tabular Reports		4. DATE February 27, 1991

5. DESCRIPTION

The Contractor shall submit a Tabular Report with the primary sort on the event number for the same data as reflected in the Intermediate Schedules.

This report will contain all events/milestones contained in the scheduling database. This listing shall contain the start/completion date, number of work days required to complete the task, amount of float/ slack in work days, description of event/milestone, and the baseline start/completion date for each event.

Ref: GHB 7120.1 WBS Handbook

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Electronic version not required.

8. TYPE Document	9. SOW REFERENCE 3.1.5.2

1. NUMBER 115/MG3	DATA ITEM DESCRIPTION	2. QUANTITY 3 copies
3. TITLE 90-Day Window Report		4. DATE February 27, 1991

5. DESCRIPTION

This report shall reflect all the events which are expected to start/complete within 90-days after the current reporting cycle; e.g., report as of July 31 shall reflect events that will start or complete during July, August, and September.

Ref: GHB 7120.1 WBS Handbook

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Electronic version not required.

8. TYPE Document	9. SOW REFERENCE 3.1.5.2

1. NUMBER 116/MG3	DATA ITEM DESCRIPTION	2. QUANTITY 3 copies
3. TITLE Work Packages/Scheduling System Cross Reference Guide		4. DATE February 27, 1991

5. DESCRIPTION

This document shall provide the traceability between the Contractor's work package planning sheets and events contained in the automated scheduling system. This document shall show a summary of all job numbers (work packages) associated with a particular event in the scheduling system. This deliverable item is the major link between the cost control function and the scheduling system.

Ref: GHB 7120.1 WBS Handbook

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Electronic version not required.

8. TYPE Document	9. SOW REFERENCE 3.1.5.2

1. NUMBER 117/MG3	DATA ITEM DESCRIPTION	2. QUANTITY 3 copies
3. TITLE End Item Float Report		4. DATE February 27, 1991

5. DESCRIPTION

A monthly report shall be submitted reflecting the End Item Float for each deliverable; e.g., the Power Control Unit delivered to Integration and Test.

This report shall compare the current month float to the float of the previous month and baseline changes will be explained. This report shall contain the following information:

Event Number:	The appropriate event number in the scheduling system.
Description:	The name of the deliverable item.
Current Month Float:	Float will be reflected in the number of work days for the current month.
Previous Month Float:	Float will be reflected in the number of work days for the previous month.
Baseline Float:	Float will be reflected in the number of workdays from the baseline network.
Reason:	All changes to the float from the previous month to the current month will be explained.

Ref: GHB 7120.1 WBS Handbook

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Electronic version not required.

8. TYPE Document	9. SOW REFERENCE 3.1.5.2

1. NUMBER 118/MG3	DATA ITEM DESCRIPTION	2. QUANTITY 3 copies (monthly)
3. TITLE Monthly Analysis		4. DATE February 27, 1991

5. DESCRIPTION

A monthly analysis shall be submitted for each major subsystem. This will contain a brief description of the current status and existing or potential problems. The primary critical path will be explained along with possible work-around techniques being considered to maintain schedule condition.

A chart reflecting the primary critical path shall be submitted on 8 1/2" x 11" paper suitable for making into viewgraphs.

Ref: GHB 7120.1 WBS Handbook

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Electronic version not required.

8. TYPE Document	9. SOW REFERENCE 3.1.5.2

1. NUMBER 119/MG3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Contractor Cost Reporting — 533 Requirements		4. DATE February 27, 1991

5. DESCRIPTION

The Contractor shall provide monthly and quarterly NASA 533 cost reports according to NHB 9501.2b. In addition these reports will be correletable to the Performance Measurement Status Reports (109/MG3) provided by the Contractor.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Electronic version not required.

8. TYPE Document	9. SOW REFERENCE 3.1.5.2

1. NUMBER 120/MG3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Monthly Contractor Manpower Reporting		4. DATE February 27, 1991

5. DESCRIPTION

The Contractor shall provide a monthly manpower report broken down in the major WBS elements of the contract (Level 2). This report will be on a hard copy format. The report shall be submitted within three work days following the close of the Contractor's work month. It will itemize subcontractor manpower, and will reflect the actual headcount of personnel onboard as of the last day of the month. The Monthly Report should be in the format

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Electronic version not required.

8. TYPE Document	9. SOW REFERENCE 3.1.5.2

1. NUMBER 120/MG3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Monthly Contractor Manpower Reporting		4. DATE February 27, 1991

5. Description (cont'd)

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Electronic version not required.

8. TYPE Document	9. SOW REFERENCE 3.1.5.2

1. NUMBER 201/SE1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE ECS Systems Engineering Plan		4. DATE December 21, 1990

5. DESCRIPTION

The Systems Engineering (SE) Plan defines the overall role of the ECS Contractor Systems Engineering Team and identifies Contractor activities and methods for the completion of all systems engineering analyses, efforts, functions and supporting activities. This plan will address SE functions, products, interfaces, procedures, organization, responsibilities, and other activities as are relevant to accomplish the SE task.

The plan shall describe the Contractor's approach to performing the overall system design, how system requirements will flow down to progressively lower levels, and how lower-level designs will be integrated to assure integrity. The plan shall identify and discuss any trade studies that the Contractor proposes to perform. The plan shall identify and discuss the interfaces and interactions between the design, integration, and testing of the system.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.2.2.1

1. NUMBER 202/SE1	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE ECS Standards & Procedures		4. DATE December 21, 1990

5. DESCRIPTION

Identifies and describes the standards to be used in implementing the ECS and the Contractors' approach for implementing the standards. It will also define the engineering, data, and communication standards to be used throughout the development and operational phases of the ECS program. It also describes the selection of the chosen standards and any anticipated limitations or problems associated with application of the standard.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.2.1.2

1. NUMBER 204/SE3	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE Annual Capabilities, Requirements and Technology Report		4. DATE December 21, 1990

5. DESCRIPTION

An Annual Report shall be produced which describes the evolutionary progress and future direction of the ECS development. Specifically, the Report shall:

a. Describe the capabilities developed and delivered;
b. Report on user acceptance of delivered and prototype capabilities;
c. Include an update of requirement analyses (trace evolution of requirements, identify undefined requirements, and discuss requirements issues);
d. Discuss the state of technology as related to the ECS:
e. Evaluate strengths/weaknesses of technology candidates for implementation and potential capabilities/risks of evolving technologies.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.8.3.5, 3.2.2.1

1. NUMBER 205/SE1	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE Science User's Guide and Operations Procedures Handbook		4. DATE May 1994

5. DESCRIPTION

Contains the procedures to enable remote users to use ECS Services by signing-on from terminals at their home institutions. Provides a reference to user capabilities and a directory of system personnel to call for assistance. In addition, it provides ECS information required by science software developers.

This document provides a user with enough information to exercise all options and provide all instructions and procedures necessary to permit the user to initiate, run, and terminate an interactive session with the ECS system. The Handbook shall include a complete description of all anomalous conditions and their remedies and a decision tree of diagnostic and verification capabilities provided for troubleshooting and maintenance. The handbook shall describe in clear and concise user-oriented language the means by which the user may access the capabilities provided. All procedures shall be described in step-by-step detail with suitable illustrations and examples provided. All commands or other entries to the system, by whatever means (e.g., as keyboard, tape, disc file, communications line entries, etc.) to be provided by the user, shall be described in full detail and their use thoroughly explained and illustrated. All capabilities provided and product services, including all options, shall be fully described and explained.

For providers of science software, this document describes delivery procedures and contents (including sample documents and formats), and information regarding use of ECS-provided integration and verification tools.

The document includes 4 Volumes:

(1) Getting Started (overview of services)
(2) Finding and Using EOS Data
(3) Requesting EOS Data Acquisition
(4) Science Software Delivery and Integration

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.2.3.5, 3.8.3.4.2

1. NUMBER 206/SE2	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE Version 0 Analysis Report		4. DATE December 21, 1990

5. DESCRIPTION

Contains the analysis of the EOSDIS Version 0 design and recommendations for the degree to which the Version 0 design should be incorporated into the ECS. Documents the analysis activity and provides the rationale for all recommendations regarding the incorporation or omission of the Version 0 design elements.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.2.3.1

1. NUMBER 207/SE1	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE ECS System Design Specification		4. DATE December 21, 1990

5. DESCRIPTION

Establishes the structure and organization of the system. Allocates the requirements of the ECS Functional and Performance Requirements Specification to the ECS elements, subsystems, and components and identifies the most effective architecture and system configuration that satisfy these requirements. Identifies each subsystem and defines the types and characteristics of interfaces between them, enabling subsystem requirements analysis to be performed on a element by element basis. The document shall define how the Contractor's system design shall meet the performance, design, and test requirements for the system.

The ECS System Design Specification specifies the allocated functional, performance, and interface requirements for the ECS system. Additionally, the ECS System Design Specification specifies the requirements for the characteristics, logistics, quality factors, design, and the qualification of the system.

This specification provides a general overview of the system which may be required by trainers, support personnel, or other users of the system.

This document is a detailed description of the system design configuration allocated to hardware, software, operations, and data. It serves as an initial decomposition of the design into Hardware Configuration Items (HWCI) and Computer Software Configuration Items (CSCI). The hardware design description may be limited to *classes* of COTS products. The software description will be at a level of detail to allocate detailed segment design and may describe classes of COTS products.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.2.3.1, 3.3, 3.3.2.2

1. NUMBER 208/SE1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Methodology for Definition of External Interfaces		4. DATE December 21, 1990

5. DESCRIPTION

Describes the approach the Contractor will follow to define ECS external interfaces. Identifies the interfaces and the organizations which will be contacted. Describes the documentation to be developed to define the interfaces and the process which will be used to define and negotiate agreement concerning the external interfaces.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.2.3.5

1. NUMBER 209/SE1 (F) 209/SE2 (P)	DATA ITEM DESCRIPTION	2. QUANTITY 25copies each external interface
3. TITLE External Interface Control Documents (ICDs)		4. DATE December 21, 1990

5. DESCRIPTION

Documents the configuration of all ECS external interfaces and serves as the baseline for Project CCB approval and control of the interfaces. Defines the functional and performance characteristics that exist between the ECS and other systems. Specific data formats as well as interface characteristics shall be addressed.

The Contractor shall prepare and maintain or support the preparation and the maintenance of the External Interface Control Documents that describe the interfaces necessary to assure hardware, software, and operational service compatibility between the ECS and other systems.

When issued at PDR/IDR the ICDs shall define the functional design of each ECS interface. When issued at CDR, figures and tables shall be included as necessary to define interface characteristics. The ICDs shall identify:

- Data formats
- Data rates
- Duty cycles
- Physical interfaces
- Protocols
- Dialogs
- Error conditions

of each external interface.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.2.3.5

1. NUMBER 210/SE3	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE Risk Assessment Report		4. DATE December 21, 1990

5. DESCRIPTION

This report identifies possible high risk areas in the design, manufacture, integration, or test of the ECS systems and appropriate plans for mitigating action. The system risk assessments shall assess the risk involved in achieving technical objectives, goals, and schedules within budget funds. Plans and associated costs to provide corrective action through alternate or backup approaches, if such actions are required, shall be included. This report shall include, but not be limited to, the following:

a. Proper identification of the risk — identify the right problem and relationship of the evaluation technique employed.
b. Selection of risk evaluation criteria — use a single criterion measure versus multiple criteria mix in the quantification of element performance.
c. Weighting of evaluation criteria — examine the relative weight in terms of significance of level of importance of each criterion factor employed.
d. Quantify the evaluation factors.
e. Use ratios as a means of evaluation.
f. Select an operational life cycle.
g. Determine subsystem interaction effects.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.3.2.5, 3.2.4

1. NUMBER 211/SE3	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE Trade-off Studies Analytical Data		4. DATE December 21, 1990

5. DESCRIPTION

Contains the results of trade-off studies and analyses (e.g., cost/performance, modeling and simulation, data flow, make/buy, risk) as required to support design decisions. This document establishes the analytical data results used to define the system-level performance, design, and the verification requirements and identifies trade-off analyses used to define the technical requirements, specifications, designs, and interface requirements from the overall system-level down to the component level.

The reports shall include, but not be limited to, trade-off analyses; design analyses; and technical risk assessment analyses, with supporting data to define the individual hardware/software items; interfaces; and the integrated configuration at any hardware item-level for the system.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.2.3.1

1. NUMBER 213/SE2	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE ECS Life Cycle Cost Report		4. DATE December 21, 1990

5. DESCRIPTION

The ECS Life Cycle Cost Report shall contain the results of running the LCC model. It shall use the ECS Work Breakdown Structure (WBS) matrix as a baseline for allocating system costs. The report shall include the cost of development, acquisition, operation, upgrades (including newer versions of COTS software), correction of latent defects, and related system support over the ECS lifetime. The report shall also include the cost of any necessary maintenance subcontracts.

The report shall describe the ECS system in terms of the cost parameters used as a basis for cost trade-offs during the design, development, production and operation of the ECS. The estimates are needed to determine lowest cost of ownership to the Government.

All estimates shall show rationale behind cost figures and provide detailed cost breakdowns where necessary to support large cost allocations. Current status and change to the Life Cycle Cost shall be reported in the Monthly Progress Report.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.2.5

1. NUMBER 214/SE1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE ECS Security Plan		4. DATE December 21, 1990

5. DESCRIPTION

This plan shall document the Contractor's security approach. Preparation of this plan shall include an initial security risk analysis for the ECS (DID 215/SE3).

The following functional elements shall be addressed to a level of detail sufficient to provide a complete understanding of the approaches used to secure the ECS and its operations:

a. Physical security.
b. Personnel security.
c. informational security measures.
c. Communications security to include emissions security.
e. ADP systems security.
f. Multiple sites and installations.

This plan shall show the allocation of processing to individual computers based on the sensitivity levels of the data to be processed, i.e., how processing is partitioned among computers in each element based on the sensitivities of the data processed. A risk analysis shall be periodically conducted and documented in this analysis report.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.2.4

1. NUMBER 215/SE3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Security Risk Analysis Report		4. DATE December 21, 1990

5. DESCRIPTION

Periodic risk analyses must be conducted for new and existing data processing installations to assure that appropriate, cost-effective protective measures are incorporated and are commensurate with the sensitivity, criticality, and value of associated computer systems, computer applications, and information processed. The risk assessment process is described in ¶ 303 of NHB 2410.9A, NASA Automated Information Security Handbook, September 1990. The process is to be documented in the Security Risk Analysis Report. Any actions required resulting from this report will be documented one month later in the Security Risk Management Plan (DID 627/OP3)

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.2.4

1. NUMBER 216/SE1	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE ECS Requirements Specification		4. DATE December 21, 1990

5. DESCRIPTION

Serves as the revised version of the Government's Functional and Performance Requirements Specification for ECS. It represents the Contractor's baseline for the EOS Project CCB-controlled ECS Requirements Specification. Proposed updates and changes to the current baseline of the document should be identified using text markups and change bars. A change history record should be attached. In addition, proposed changes shall be submitted formally to the GS&OP CCB on the appropriate forms

This document shall contain an overview of each ECS segment and element and allocate functional and performance requirements to each element. These requirements shall include those related to system performance parameters, operation, manning, maintenance functions, and logistic support for the element. This specification will provide the functional and performance requirements baseline used to derive the ECS segment and element designs.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.2.1, 3.2.1.1

1. NUMBER 218/SE3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Project Development History		4. DATE December 21, 1990

5. DESCRIPTION

Documents significant events and information related to the design and development of the system. Contains a log of the decision process made in selecting tradeoffs. The document should describe the ECS project, present any appropriate background, discuss the development approach, and describe the history of the project in terms of schedule, size, changes, and problems. Project strengths and weaknesses along with lessons learned should also be presented.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.2.2.1

1. NUMBER 219/SE1	DATA ITEM DESCRIPTION	2. QUANTITY 25* copies
3. TITLE Interface Requirements Documents		4. DATE December 21, 1990

5. DESCRIPTION

A set of documents that defines the functional and performance requirements that exist between ECS and external systems. IRDs will define all ECS and external system requirements which must be satisfied by each interface.

The IRD specifies the requirements of the interface (s) and enables the Government to assess whether or not the ICD and the implementation of the interface complies with those requirements.

The IRD is used by the Contractor(s) as the basis for definition of the interface(s). The IRD is also used to develop External Interface Control Documents (ICDs).

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.2.3.5

1. NUMBER 220/SE1(P) 220/SE1 (F)	DATA ITEM DESCRIPTION	
		4. DATE

5. DESCRIPTION

DELETED

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 1.7, 3.2.1.1

1. NUMBER 221/SE2	DATA ITEM DESCRIPTION	2. QUANTITY 12 copies
3. TITLE CRR Input Materials		4. DATE December 21, 1990

5. DESCRIPTION

Capabilities and Requirement Reviews (CRRs) will nominally be a series of annual reviews of EOSDIS requirements, including ECS requirements, and the emerging system capabilities being developed to satisfy these requirements

The Contractor takes the lead in supporting the Project by arranging for meeting rooms and other accommodations and necessary coordination for the CRR. The Contractor also administratively supports the Project by taking minutes and recording action items at the CRR. In addition, the Contractor fully supports the CRRs by providing presentation materials including all ECS reports and information required by the Project and other CRR participants.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 2.4.1

1. NUMBER 223/SE1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE ECS External Data Traffic Requirements		4. DATE December 8, 1995

CH12

5. DESCRIPTION

Describes the requirements for all external data flows to and from ECS including the ECS related data transfers via EBnet and NSI. The ECS Contractor shall document requirements for all data flows to and from ECS sites, including the ECS related EBnet data flow requirements (EDOS to ECS Elements (DAAC, EOC, SMC), DAAC to DAAC, ADCs, TRMM, and international partners) and output to NSI (or internet provider) from each ECS site. The EDOS to ECS elements data flow requirements will be provided by EBnet based on their data traffic modeling results. The external ECS data flow requirements shall include but not be limited to the following:

-Raw data traffic estimates by Source and Destination with list of Instruments/Missions supported
-Characteristics of data traffic, e.g., real-time vs. science data, average and peak data rates
-Data traffic overhead factors relevant to ECS portion of EBnet-ECS and NSI-ECS interfaces (e.g., protocol overhead) but not to EBnet and NSI portions of the interface (e.g., WAN buffering capacity, available bandwidth in T1/T3 circuit)
-Assumptions for Raw data traffic flows

This document along with the EBnet data base will serve as a source for inputs to ongoing ECS data traffic modeling and analysis. Starting with first delivery in first week of January 1996, this document will be delivered 2 weeks before the major design reviews of each ECS Release. In addition, the changed pages (if any) will be delivered on a quarterly basis in first week of January, April, July and October throughout the life of ECS contract. If quarterly delivery of changed pages coincide with or falls very close to one of the ECS major reviews, the changed pages will not be delivered during that quarter.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 1.7, 3.2.1.1

1. NUMBER 301/DV1	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE System Implementation Plan		4. DATE December 21, 1990

5. DESCRIPTION

This plan outlines the steps by which the implementation of ECS will be accomplished. This plan will include a schedule of the sequence of releases of ECS elements at all sites involved and will address testing of individual elements and overall acceptance testing of ECS for all releases which shall include end-to-end ECS system testing of functions involving multiple sites.

This plan must be fully compliant with requirements for an evolutionary process including phased implementation with continual, active, and iterative participation by users; with prototyping, special studies, and the use of standards; and with approaches to hardware and software that facilitate evolution of the ECS. This plan will recognize that the development must be based on experience gained from implementation of the Version 0 system, and that the resulting system must incorporate the benefits of experience gained from prototyping efforts performed by the ECS Contractor and others. This plan must accommodate the fact that some essential parts of the system, such as the user interface, will evolve throughout the development cycle.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 1.3, 3.2.2.2, 3.4.5

1. NUMBER 302/DV1 (P) 302/DV2 (F)	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE ECS Facilities Plan		4. DATE December 21, 1990

5. DESCRIPTION

Provides the planning necessary to assure that each ECS segment, element, subsystem, and critical component will meet all requirements for interfacing with the facilities in which they are located. Provides ECS-wide facility requirements and an overall physical plan for ECS facilities and operations areas. The plan, especially as applied to the DAACs, shall be responsive to stated plans of the organization providing the location for accommodating the ECS requirements for that facility. Discrepancies between accommodations planned by the host facility and needs of the ECS Contractor shall be called out.

The Facilities Plan shall, as a minimum, contain a description of the following: the partitioning of the floor space, the physical layout of the equipment, electrical power requirements, air conditioning requirements, and antenna foundation requirements. It shall also provide final equipment layout, mechanical/electrical loads, and functional arrangement.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval. All facility level drawings should be in accordance with 500-TIP-3109 and X-673-64-1D.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.2.2.2

1. NUMBER 304/DV1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies each specification
3. TITLE Segment Requirements Specification		4. DATE DECEMBER 14, 1990

5. DESCRIPTION

This specification shall specify the functional and performance requirements for the subsystems and components of each ECS segment/element. The document shall contain, as a minimum, the following sections:

a. Scope — Definition of purpose and use of each module to be developed.
b. Applicable Documents — List of all pertinent documentation, including all documents describing the sources of the requirements.
c. Definitions.
d. Major tasks — General description of major tasks to be performed by the hardware and software.
e. Detailed Requirements — Description of every requirement within each of the major tasks.
f. Inputs — Detailed description of each input to be received and used by the subsystem or component, including: source, data description, input rate, frequency of input, quantity of data to be received each input time, format, procedures and conditions for initiating outputs. Description of each datum value to be output including units, scaling, weighting, and type.
g. Outputs — Detailed description of each output to be generated, including: destination, output rate, frequency of output, formats, quantity of data to be sent each output time, procedure and conditions for initiating outputs. Description of each datum value to be output including units, scaling, weighting, and type.
h. Exception Conditions — Description of error, out-of-tolerance or abnormal conditions and the actions required for each.
i. Special Requirements and Design Constraints — any constrains on the design, such as: allowable processing time from input through output, qualitative and quantitative data storage requirements, unique algorithms to be implemented, processing of various requirements in specified sequences and times, special parameters.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.3.2.2

1. NUMBER 305/DV3 (P) 305/DV2 (F) 305/DV2 (U/D)	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies each specification
3. TITLE Segment/ Design Specifications		4. DATE December 21, 1990

5. DESCRIPTION

PDR/IDR Version - DID 305/DV3:

The Segment Design Specifications will provide an overview of the segment and its components, allocate and decompose functional and performance requirements defined in the Segment Requirements Specification to segment components, document the design of the segment to this component level and define component interfaces.

The segment design specifications will define the physical and functional characteristics of the segment and its components in such detail as to allow the purchase or development of the components with the level of information contained in each specification.

The specifications shall contain supporting rationale for any recommendations for the use of available hardware or existing software. This effort includes the design of a fully integrated communication capability linking the ECS nodes excluding the SN, ECOM and EDOS which will be separately designed and provided by GSFC.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.3.2.3

1. NUMBER 305/DV3 (P) 305/DV2 (F) 305/DV2 (U/D)	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies each specification
3. TITLE Segment/Design Specifications		4. DATE December 21, 1990

5. DESCRIPTION (cont'd)

CDR Version - DID305/DV2:

The CDR version of this document will present the detailed design of the segment. The information will be based on the PDR/IDR version of the document. It will further decompose the segment design from the PDR/IDR level to the lowest design level.

Final Version at RRR - DID 305/DV2

The final version of each Segment Design Specification shall provide the as-built configuration of the segment design. It will use the same format as the CDR version, but will provide the updated information documenting the design using automated tools.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.3.2.3

1. NUMBER 307/DV2	DATA ITEM DESCRIPTION	2. QUANTITY 25copies each plan
3. TITLE Segment/Element Release Plans		4. DATE December 21, 1990

5. DESCRIPTION

These Release Plans are system-wide with specific plans developed for a select set of functions and capabilities assigned to each of the components (e.g., hardware or software) of a specific segment/element. The Release Plans include schedules and resources allocated to each of the components.

The Release Plans will include schedules for the element builds and will map the builds into releases, if appropriate.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.3.2.1

1. NUMBER 308/DV2	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE Software Development Plan		4. DATE December 21, 1990

5. DESCRIPTION

Describes the methodologies the Contractor will use to develop and document the ECS software. Provides a systematic approach to software development, using NASA Software Documentation Standard Engineering Program, NASA-STD-2100-91, to tailor those software engineering practices to specifically suit ECS needs. The plan is used by the government to monitor the procedures management, and contract work effort of the organizations performing software development. This plan shall also describe the ECS Automated Data Processing Equipment (ADPE) to be used in the software development environment and the software migration plan.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.2.2.2

1. NUMBER 308/DV2	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE Software Development Plan		4. DATE December 21, 1990

5. DESCRIPTION (cont'd)

The Software Development Plan shall include, as a minimum, the following:

a. Description of all software development phases, including associated deliverables and documentation.
b. Description of development and documentation methodologies to be used for requirements analysis, preliminary design, critical design, product specification, code and unit testing, integration and testing of deliverable Computer Software Configuration Items (CSCIs).
c. Description of requirements traceability mechanisms to be used through the entire development cycle.
d. Software engineering and coding standards, a description of the standards, and citation of references.
e. Annotated outline of all design documents, requirements documents, and test plans.
f. Description of test plans, from initial unit test through Release integration testing.
g. Description of automated tools to be employed for software development and control, and plans for obtaining them.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.2.2.2

1. NUMBER 311/DV1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Database Design and Database Schema Specifications		4. DATE December 21, 1990

5. DESCRIPTION

The relationships among files in the data base are described, as well as the interactions between the database files and the Computer Software configuration Items (CSCI), including any Data Base Management Systems.

The Database Design and Database Schema Specifications document serves to communicate database design decisions to NASA and guide the implementation of the database.

The Database Design and Database Schema Specifications document is used by the Contractor during the detailed design and implementation of the CSCI. It is entered into the Developmental Configuration of the CSCI.

Upon the completion of the Physical Audit , the Database Design is incorporated into the ECS Software Product and becomes a part of the Product Baseline.

The Database Design and Database Schema Specifications is used to describe in detail the contents and structure of both global and local data bases.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.3.2.3

1. NUMBER 313/DV3 (P), 313/DV3 (F)	DATA ITEM DESCRIPTION	2. QUANTITY 25copies each ICD & version
3. TITLE ECS Internal ICDs		4. DATE December 21, 1990

5. DESCRIPTION

The ECS Internal ICDs define the interfaces between the ECS segments and elements such that each ECS segment and element will meet all requirements for interfacing with the other ECS segments and elements and their facilities.

At PDR/IDR these ICDs (P) shall contain the functional descriptions of the interfaces.

At CDR these documents shall define the segment and element-level , physical, electrical, software, hardware, and data relationships internal to ECS including data flow and transfer rates. Figures and tables shall be used as necessary to define interface characteristics.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.3.2.4

1. NUMBER 317/DV1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Prototyping and Studies Plan		4. DATE December 21, 1990

5. DESCRIPTION

To support the evolution of design and requirements of the ECS Project, a Prototyping and Studies Plan will be developed. The purpose of the prototyping will be to test and evaluate alternative concepts, approaches, or implementations (which may involve newly developed technology) of ECS functions. The Prototyping and Studies Plan will define the procedures used by the ECS Contractor to solicit and introduce special studies and prototypes involving analyses of specific areas of concern. This plan will specify how proposed prototypes and studies are introduced to the government and science community, and the steps necessary for government approval prior to starting a prototype or study. Each proposal published as a white paper, will

a. identify functional areas for which prototyping is required
b. describe the approach being taken for the prototype development
c. define expected cost and schedule
d. define types and dates of prototype reviews
e. describe the prototyping activity.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.3.3.1

1. NUMBER 318/DV3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Prototyping and Studies Progress Reports		4. DATE December 21, 1990

5. DESCRIPTION

Describes progress on each ongoing prototyping and study effort. Submitted as part of the Monthly Progress Reports.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.3.3.1

1. NUMBER 319/DV1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies each plan
3. TITLE Segment/Element Integration & Test Plan		4. DATE December 21, 1990

5. DESCRIPTION

The Segment/Element Integration & Test Plan details the approach and schedule for integrating and testing each segment and element and verifying that the system complies with the ECS design specifications. The Plan identifies a schedule for performing such activities and the need for special resources. Describes responsible organizations. Provides the program manager and test personnel with a systematic approach to show that all of the requirements of the system have been satisfied by the integrated subsystems.

This plan includes material at the Segment and Element level as appropriate.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.3.5

1. NUMBER 322/DV3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies each test
3. TITLE Segment/Element Integration & Test Procedures		4. DATE December 21, 1990

5. DESCRIPTION

Defines the step-by-step procedures for implementing each test identified in the Segment/Element Integration & Test Plan.

Tests will cover segment/element operations and interfaces between elements. These test procedures shall define the specific objectives, event sequences, support requirements, configuration identification, and testing procedures for each test performed during segment/element testing.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.3.2.1

1. NUMBER 324/DV3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies each report
3. TITLE Segment/Element Integration & Test Reports		4. DATE December 21, 1990

5. DESCRIPTION

Documents the results of testing the hardware and software subsystems for each element.

These test reports document tests performed at any level in the system. They contain test logs recording the exact history of the testing, include the name and number of all tests and the results of each test, describe in detail any deviations from the test procedures, and provide a detailed test history. They also contain an overall analysis (test evaluation) of the functional capabilities of the subsystems as demonstrated by the test and include any deficiencies, limitations, or constraints inherent in the subsystem that was detected during testing.

The test report shall adequately summarize the results of verification tests and shall be prepared in such a manner that relates the test results to the verification requirements for each item under test. As a minimum, the following shall be included in the report:

a. Test Identification. Identify the specific test as shown on the test procedure.
b. References. Applicable System Test Plan and Test Procedures.
c. Test Results to Include:
    1) Identification of those planned objectives for which actual test results were identical with the expected results and those which were within specified tolerance. For the latter case, actual test results shall be shown.
    2) Identification of those planned objectives for which actual test results differ from expected results beyond specific limits.
    3) Identification of any planned test objective for which actual results were not obtained. Reasons for not fulfilling such objectives shall be stated.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.3.5

1. NUMBER 324/DV3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies each report
3. TITLE Segment/Element Integration & Test Reports		4. DATE December 21, 1990

5. DESCRIPTION (cont'd)

4) Identification of any false or aberrant behavior noted during the test or subsequent analysis. Note that any such behavior that can prevent the system from accomplishing its mission objectives can be a basis for rejection.

d. Recommendations. Recommendations for subsequent action shall be stated, based on the test results, and may include:
   1) Redesign of a particular component or computer program to enable the system to meet a specific requirement which was not fulfilled.
   2) Revision to a Development Specification or the System Specification in cases where the test results disclose ambiguity or conflicting requirements.
   3) Conducting additional tests to fulfill objectives for which results were not accepted.

e. Test Plan and Procedure Changes. Any deviations from the approved test plans/procedures that were followed during official conduct of the test shall be documented as revision pages to the affected documents and shall be appended to the report. Acceptance of the report shall also constitute acceptance of the appended changes.

6. FORMAT

7. DELIVERY

8. TYPE Document	9. SOW REFERENCE 3.3.5

1. NUMBER 326/DV3	DATA ITEM DESCRIPTION	2. QUANTITY 25* copies
3. TITLE Monthly Tabulation of Software Errors		4. DATE December 21, 1990

5. DESCRIPTION

Contains a cumulative log of software errors found by the integration team and the Independent Acceptance Test Organization (IATO).

Errors shall be tabulated by the major subsystem and versions affected and categorized by the severity of the effect on further testing and overall system operation. Multiple occurrences of the same error, to the extent identified, shall be combined into one entry. Errors shall also be noted as to their reproducibility or sporadic nature. Fields shall be provided to identify the specific software module in error, where known, and the solution when provided.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.3.5

1. NUMBER 329/DV2	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies each plan
3. TITLE Segment/Element Development Plans		4. DATE December 7, 1990

5. DESCRIPTION

This plan will identify the implementation approach for the development of each segment and element, including the development and incorporation of prototypes and the partitioning of the task into blocks and builds.

Development Plans provide detailed plans of schedule, and technical development factors required to implement each segment/element.

A Development Plan shall be prepared for each segment/element. The plans shall identify a phased implementation approach for the development of each segment/element and allocate segment/element functions among the phases. The plans shall show the organizations of the development effort to the lowest level of the Work Breakdown Structure (WBS). Technical efforts, and schedules associated with the development shall be defined consistent with overall system development plans.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.3.2.1

1. NUMBER 331/DV3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Prototyping and Studies Final Report		4. DATE December 21, 1990

5. DESCRIPTION

This Report documents the completed prototyping and study activities. It summarizes the approach taken for each prototyping or study activity and the level of effort and schedules, documents, and revisions to the original plans as required and documents the results of each activity or study.

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.3.3.1

1. NUMBER 332/DV3	DATA ITEM DESCRIPTION	2. QUANTITY 25* copies
3. TITLE Release Experience Report		4. DATE December 21, 1990

5. DESCRIPTION

This report details comments, criticisms, and suggestions from the Science Advisory Panel, DAAC science advisory panels, program and project scientists, and science users of each Release. This report shall include the Contractor's assessments and responses, in the science user feedback. It shall propose prototyping efforts to resolve problems or questions raised with each Release.

This document will also be used to document development information that would be of use in the sustaining engineering phases.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.2.3.1

1. NUMBER 333/DV1	DATA ITEM DESCRIPTION	2. QUANTITY 100 copies
3. TITLE PGS Toolkit Users Guide for the ECS Project		4. DATE May, 1994

5. DESCRIPTION

Details the services available from the ECS to science algorithms. Completely describes the toolkit bindings and/or UNIX shell command syntax for file access, mass storage, and other resource allocation, job control parameter passing, error logging and operator communication, ancillary data services, and execution scheduling services, and other ervices as needed. Describes the limitations, interdependencies, and intended use of such services by science algorithms running in the production environment at a PGS, in the integration and test mode at a PGS, or in the development and test mode at an SCF.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.2.3.5, 3.5

1. NUMBER 401/VE1	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE Verification Plan		4. DATE December 21, 1990

5. DESCRIPTION

A plan for the verification of each release of the ECS and its main segments, and their composite elements. The plan shall describe the test, review, and analysis effort to be conducted at each stage of development of the system and each level of assembly of hardware and software to demonstrate that the item to be verified meets the relevant design requirements. The Plan shall be iteratively updated to reflect system evolution throughout the development life cycle of the release, with each iteration reflecting the current stage of verification planning at the current delivery milestone stated in the CDRL.

The Verification Plan shall include:

a. Software test plans (PAR 3.3.3);
b. Overall test matrix.

The overall test matrix summarizes all tests that will be performed within each ECS Segment and Element on each of its hardware components and subsystems, on each of its software units and subsystems, and on the combined hardware-software functional subsystems.

Required by GSFC 42-05-03, ¶3.1.1.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.6, 3.7

1. NUMBER 402/VE1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies each plan
3. TITLE ECS System Integration & Test Plan		4. DATE December 21, 1990

5. DESCRIPTION

Overview delineates the process for integrating the major ECS segments and elements and verifying that the ECS complies with the system design specification. Identifies a schedule for performing such activities and the need for special resources. Describes responsible organizations. Provides the program manager and test personnel with a systematic approach to show that all system specifications have been satisfied by the integrated subsystems.

Final outlines the steps by which the implementation of the next ECS Release will be accomplished. This plan will include a schedule of the sequence of element Threads and Builds of the new ECS Release. The Plan will address testing of individual elements and system level integration of the new ECS Release which includes end-to-end ECS system testing of functions.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.6.1, 3.2.2.4

1. NUMBER 403/VE1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies each specification
3. TITLE Verification Specification		4. DATE December 21, 1990

5. DESCRIPTION

This document stipulates the specific portions or functions of the system design requirements to be demonstrated by each of the tests and analyses required by the System Integration and Test Plan (402/VE1) and Acceptance Test Plan (409/VE1) providing a system level mapping of tests that will be performed for each implementation of the ECS Release.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.6, 3.7

1. NUMBER 404/VE1	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE Procedure for Control of Unscheduled Activities During Verification		4. DATE December 21, 1990

5. DESCRIPTION

This document shall establish the procedures for controlling, documenting, and approving all activities not part of an approved verification procedure or software test procedure. Appropriate real-time decision making mechanisms to expedite continuation (or suspension) of testing after a malfunction shall be documented.

Required by GSFC 42-05-03, ¶3.1.4.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.6, 3.7

1. NUMBER 405/VE3	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE ECS System Integration & Test Report		4. DATE December 21, 1990

5. DESCRIPTION

Documents the result of testing the system. Contains a log recording the exact history of the results of the tests. Describes in detail any deviations from the test procedures and provides a detailed test history. Contains an overall analysis (test evaluation) of the functional capabilities of the system as demonstrated by the test. Includes any deficiencies, limitations, or constraints inherent in the subsystem that were detected during testing.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.6.1

1. NUMBER 409/VE1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE ECS System Acceptance Test Plan		4. DATE December 21, 1990

5. DESCRIPTION

This plan must satisfy the philosophy of the Verification Plan (DID 401/VE1) while providing the more rigorous atmosphere of formal testing. The Plan delineates the tests and acceptance criteria for the system as well as the schedule for the tests. Includes a verification matrix for traceability to the system requirements. Includes discussion of any limitation assumed in acceptance testing that would not allow the system to be accepted in the operational environment. Guides development of the acceptance test procedures and the acceptance test report.

The test plan shall provide detailed descriptions of all aspects of the test program covering such items as:

- Purpose of each test as derived from Operations Scenarios (DID 605/OP2) and user feedback;
- Sequence of each series of tests;
- Schedule of tests to be performed;
- Definition of all tests scheduled;
- Definition of test support requirements;
- Hardware/Software to be tested;
- Facility requirements;
- Criteria for test item acceptance/rejection.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.2.2.4, 3.6.2

1. NUMBER 411/VE1	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE ECS System Acceptance Test Procedures		4. DATE December 21, 1990

5. DESCRIPTION

Contains the step-by-step procedures for implementing each formal test in the acceptance test procedure, including the detailed procedures for data reduction and analysis of the test results. Includes description of pretest requirements, test limitations, and the overall test schedule. (Test schedule includes test briefing, formal conduct of the test, and debriefing.)

The Acceptance Test Procedures shall define the specific objectives, event sequences, support requirements, configuration identification, and testing procedures for each acceptance test or series of test to be performed during acceptance testing of the ECS.

Procedures shall identify test requirements for the item or unit under test and shall follow the outline of the test plan. Individual requirements shall be verified in such a manner that expedites review of the acceptability of the item under test. Test procedures shall be written such that they are concise, easily understood by testing personnel, and establish definitive accept/reject criteria for the items under test. As a minimum, the following information shall be included in the procedures:

a. Nomenclature and identification of the test article or material. Identification of test configuration and any differences from the as-designed configuration;
b. Identification of objectives and criteria to be inspected or tested, including values, with tolerances, for acceptance or rejection;
c. Characteristics and design criteria to be inspected or tested, including values, with tolerances, for acceptance or rejection;
d. Description, in sequence, of steps and operations to be taken;
e. Identification of system resources and computer software required.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.6.2

1. NUMBER 411/VE1	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE ECS System Acceptance Test Procedures		4. DATE December 21, 1990

5. DESCRIPTION (cont'd)

f. Identification of measuring, test, and recording equipment to be used, specifying range, accuracy and type;
g. Certification that required computer test programs, support equipment and test software have been verified prior to use with hardware under test;
h. Any special instructions for operating data recording equipment or other automated test equipment as applicable;
i. Layouts, schematics, or diagrams showing identification, location, and interconnection of test equipment, test articles, and measuring points;
j. Identification of hazardous situations or operations;
k. Precautions and safety instructions to insure safety of personnel and to prevent degradation of test articles and measuring equipment;
l. Environmental and/or other conditions to be maintained with tolerances;
m. Constraints on inspection or testing;
n. Special instructions for nonconformances and anomalous occurrences or results;
o. Specification for facility, equipment maintenance, housekeeping, certification, inspection, safety and handling requirements before, during, and after the test activity;
p. Detailed procedures for data reduction and analysis of the test results.

Procedures shall be prepared in logical format and should correlate as applicable to the corresponding test plan (paragraph 3.3.3 and 3.2 of the ECS PAR). The format may provide blank forms for recording test results and narrative comments in order that the completed procedure serve as part of the test report.

6. FORMAT

7. DELIVERY

8. TYPE Document	9. SOW REFERENCE 3.6.2

1. NUMBER 412/VE2	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE ECS System Acceptance Test Report		4. DATE December 21, 1990

5. DESCRIPTION

Documents results of the formal acceptance of the system. Contains a test log recording the exact history of the testing. Contains the name and number of all tests and the results of each test. Describes in detail any deviations from the test procedures and provides a detailed test history. Contains an overall analysis (test evaluation) of the functional capabilities of the system as demonstrated by the test. Includes any deficiencies, limitations, or constraints inherent in the subsystem that was detected during testing.

The test report shall adequately summarize the results of verification tests and shall be prepared in such a manner that relates the test results to the verification requirements for each item under test. As a minimum, the following shall be included in the report:

a. Test Identification. Identify the specific test as shown on the test procedure.
b. References. Applicable System Test Plan and Test Procedures.
c. Test Results to Include:
    1) Identification of those planned objectives and for which actual test results were identical with the expected results, were within specified tolerance. For the latter case, actual test results shall be shown;
    2) Identification of those planned objectives for which actual test results differ from expected results beyond specific limits;
    3) Identification of any planned test objective for which actual results were not obtained. Reasons for not fulfilling such objectives shall be stated;
    4) Identification of any false or aberrant behavior noted during the test or subsequ

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.6.1, 3.6.2

1. NUMBER 412/VE2	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE ECS System Acceptance Test Report		4. DATE December 21, 1990

5. DESCRIPTION (cont'd)

5) For each hardware test, the report shall contain as a minimum the information described in paragraph 3.1.5 of the ECS PAR.

.d. Recommendations. Recommendations for subsequent action shall be stated, based on the test results, and may include:

1) Redesign of a particular component or computer program to enable the system to meet a specific requirement which was not fulfilled.
2) Revision to a Development Specification or the System Specification in cases where the test results disclose ambiguity or conflicting requirements.
3) Conducting additional tests to fulfill objectives for which results were not accepted.

e. Test Plan and Procedure Changes. Any deviations from the approved test plans/procedures that were followed during official conduct of the test shall be documented as revision pages to the affected documents and shall be appended to the report. Acceptance of the report shall also constitute acceptance of the appended changes.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.6.2

1. NUMBER 413/VE3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies monthly after acceptance testing begins
3. TITLE Discrepancy Reports		4. DATE December 21, 1990

5. DESCRIPTION

Provides a complete description of any variances in the design and "build to" specifications versus the capability of the delivered system. Provides analysis of the final acceptance testing and a comparison between the system described in the SRR and the delivered system. Provides material to be considered in the Operational Readiness Reviews (ORR).

This document shall be based on the results of the final acceptance testing of the system. It shall define all deviations between the system as described in the ECS Requirements Specification and the delivered and tested system. This report shall be used at the Operational Readiness Review for the system to approve the readiness of the system for full-scale operation.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.6.2

1. NUMBER 414/VE1	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE ECS System Integration & Test Procedures		4. DATE December 21, 1990

5. DESCRIPTION

Defines the procedures to accomplish system level end-to-end tests to demonstrate the operational capability of the ECS system and test the system interfaces. These procedures shall define the specific objectives, event sequences, support requirements, configuration identification, and test or series of tests performed during system testing.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.6.1

1. NUMBER 415/VE1	DATA ITEM DESCRIPTION	2. QUANTITY 25 * copies
3. TITLE Acceptance Testing Management Plan		4. DATE December 21, 1990

5. DESCRIPTION

Describes the charter of the organization and details the responsibilities, methods and general procedures to be used by the Independent Acceptance Test Organization (IATO) and how it will interface with the development organization(s), Contractor management personnel and with the Government.

This Acceptance Testing Management Plan will detail how:

a. Test items are to be delivered to the IATO;
b. Test plans and procedures will be prepared and reviewed;
c. Tests will be conducted;
d. Discrepancies will be documented and tracked;
e. Discrepancies will be reported to the development organization(s);
f. Resolution of discrepancies will be retested and certified;
g. Test items will be delivered to the configuration management organization for baselining and control upon successful completion of acceptance testing.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.6.2

1. NUMBER 501/PA1	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE Performance Assurance Implementation Plan (PAIP)		4. DATE February 27, 1991

5. DESCRIPTION

Describes the performance assurance activities to be used by the project to ensure that the products delivered comply with mission requirements. Details the performance assurance activities to be carried out by the project, defines the schedule of the activities, shows the performance assurance organization, and describes its relationship to the project organization and other outside organizations. Addresses the establishment of a program to audit the system development and the preparation and maintenance of performance assurance standards and procedures. Addresses specific activities of the performance assurance organization within each phase of the system development life cycle

The plan shall include the areas of hardware, software, operational, and RMA procedures.

Hardware:
The hardware portion of this plan will address, as a minimum the following activities –

- Installation, equipment maintenance, equipment modification, and repair;
- Test, repair, and calibration of precision measurement equipment;
- Receiving inspection and stock control;
- Controlling nonconforming items;
- Control of purchased equipment;
- Failure reporting and corrective action;
- Preservation, packing, marking, and shipping procedures.

Software:
The software portion of the plan describes the Contractor's approach for implementing the software performance assurance program. It contains Contractor's software performance assurance program tailored to the Project that meets or exceeds the requirements of SMAP-GB-A201.

(cont'd)

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7, 3.7.1, 3.7.2, 3.8.1.5

1. NUMBER 501/PA1	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE Performance Assurance Implementation Plan		4. DATE February 27, 1991

5. DESCRIPTION (cont'd)

Operational Procedures:
The operational procedures portion of the plan defines management responsibilities and organizations.

RMA Program Plan:
The RMA Program Plan portion of the PAIP describes the approach for the coordinated program of RMA activities in the ECS and the effort involved in each RMA task and a corresponding schedule related to ECS program milestones.

Required by GSFC 420-05-03, ¶ 1.3.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7, 3.7.1, 3.7.3, 3.8.1.5

1. NUMBER 502/PA3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies	CH07
3. TITLE Contractor's Practices & Procedures Referenced in the PAIP		4. DATE March 1995	CH07

5. DESCRIPTION

One copy of each procedure and documented instruction referenced in the PAIP.

Required by GSFC 420-05-03, ¶1.3.2.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7, 3.7.1

1. NUMBER 503/PA3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Performance Assurance Status Report		4. DATE April 9, 1991

5. DESCRIPTION

The Contractor shall submit Performance Assurance Status Reports which include pertinent information and the status of items as listed below as well as those in the PAR:

a. Key organization and personnel changes;
b. Significant assurance problems;
c. Safety issues;
d. Hardware inspection and test activities;
e. Software and system verification activities;
f. Procurements and subcontract assurance programs;
g. Audit reports summaries of internal and subcontractor audits;
h. Summary reports of Contractor reviews;
i. Alert surveys;
j. Results of trend Analyses;
k. Status summaries of open software nonconformance reports;
l. Status summaries of open malfunction reports;
m. Operating failures;
n. Repair/replacement maintenance events;
o. Unavailability of required spares and attendant delays;
p. Significant operations or maintenance problems.

(may be part of Monthly Progress Reports)

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7, 3.7.1, 3.7.2

1. NUMBER 504/PA1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Data on Previously Designed Hardware and Software		4. DATE December 21, 1990

CH14

5. DESCRIPTION

Data to show that the existing-design hardware and the previously designed software (other than those developed for an earlier release of the ECS) meet the ECS requirements:

a. Hardware. Reliability, maintainability, and availability (RMA) data on all procured hardware units adequate to support the design and evaluation of a ground system meeting ECS requirements. This includes procurement specifications for all units that state the applicable RMA data requirements, the hardware interface design requirements, and the quality conformance criteria. This also includes data to demonstrate that the delivered hardware meets the specified requirements.

b. Software. Data on all previously developed software proposed for ECS use must include:

   1) A comparison of the software requirements for the existing software item with the requirements for the program's function on EOSDIS and evidence that each design and interface requirement for the existing item will meet the corresponding EOSDIS requirement without interference with other functions.

(cont'd)

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media

8. TYPE Document	9. SOW REFERENCE 3.7, 3.7.1

1. NUMBER 504/PA1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Data on Previously Designed Hardware and Software		4. DATE December 21, 1990

CH14

5. DESCRIPTION (cont'd)

2) Documentation derived from the verification and validation (V&V) records of the previous program under which the software was developed to show the directness of applicability of each requirement, characteristic, and function verification from the previous use to the corresponding ECS requirement. For any parts of the previous V&V program that are not identical with the corresponding V&V requirements for ECS, the differences shall be documented, the acceptability of the previous V&V for EOS shall be justified, and additional measures planned to demonstrate the suitability of the software item for ECS shall be described.

3) Identification of all waivers and deviations accepted on the previous program which potentially involve this software. If any of these waivers or deviations affect a software design requirement of the previous program that is also a requirement of the ECS, describe what will be done to achieve compliance or provide a rationale and supporting information stating why the difference is considered acceptable.

4) Description of mission experience with the previously developed software including, in particular, a description of all problems or anomalies potentially involving this software, their cause, and any corrective action that was taken as a result.

5) Description of the additional testing planned to demonstrate the compatibility of the previously developed software with the ECS software and hardware, and identification of the measures to be taken to ensure that the previously developed item does not introduce unwanted effects potentially resulting in malfunctions or conflicts in system operation.

Required by GSFC 420-05-03, ¶1.4.

6. FORMAT

7. DELIVERY

8. TYPE Document	9. SOW REFERENCE 3.7, 3.7.1

1. NUMBER 505/PA3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Description of Contractor and Subcontractor Audit Programs (in PAIP)		4. DATE December 21, 1990

5. DESCRIPTION

Contractor's plan of program to audit effectiveness of its internal performance assurance system and those of its subcontractors and suppliers to ensure compliance with the provisions of the Implementation Plan and the contract.

Required by GSFC 420-05-03, ¶1.9 and 1.9.1.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7

1. NUMBER 506/PA3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Audit Reports		4. DATE December 21, 1990

5. DESCRIPTION

A documented account of each audit shall be provided for the record and to management of the audited organizations with recommendations for correction of deficiencies.

Summaries of the Audit Reports shall be included in the Performance Assurance Status Reports.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7, 3.7.1

1. NUMBER 508/PA1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Responses to Review Team Recommendations and Action Items		4. DATE December 21, 1990

5. DESCRIPTION

Written responses to questions and action items established by the review team at each review are required by GSFC 420-05-03.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.4

1. NUMBER 510/PA1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Summary Reports of Contractor Reviews		4. DATE December 21, 1990

5. DESCRIPTION

A summary report of each Contractor review occurring each month is to be provided with the monthly Performance Assurance Status Report, as required by GSFC 420-05-03.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE N/A

1. NUMBER 511/PA1	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE Maintainability Demonstration Plan		4. DATE December 21, 1990

5. DESCRIPTION

This is a plan of the maintainability demonstration tests to be conducted to verify the capability of the planned maintenance activities to meet the operational availabilities/mean down times stated in the ECS F&P Specification for identified system functions. Other objectives of the tests are to evaluate the adequacy of fault detection or isolation methods and the ability to achieve LRU replacements or on-site repairs to meet criteria stated in the Maintenance Plan. The Maintainability Demonstration Plan shall identify and outline the test specification requirements of each individual test plan for each of the planned demonstration tests.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7

1. NUMBER 512/PA1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Maintainability Demonstration Test Plans		4. DATE December 21, 1990

5. DESCRIPTION

Test plans for each of the individual demonstration tests included under the Maintainability Demonstration Plan.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7

1. NUMBER 513/PA2	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Hazard Analyses		4. DATE December 21, 1990

5. DESCRIPTION

These are documented analyses identifying both hardware and software hazards for each Element and Segment in the ECS. In the hardware area, the analysis shall identify hazards to personnel and to the equipment. In the software area, the analyses shall focus on the software critical items (see par. 6.4 of ECS PAR) and examine the potential malfunctions (hazards) that can result in damage to or loss of the flight hardware or the mission, including loss of critical science data.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7

1. NUMBER 514/PA2	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Security-Sensitive Items List		4. DATE December 21, 1990

5. DESCRIPTION

This is a list of the software and hardware items that are sensitive to loss, tampering, or misuse that can result in potential harm to EOSDIS functions (see also par. 5.5 of the ECS F&P Specification). Any whose sensitivity is considered to be "significant" (as determined by the Project) shall be identified on a security-sensitive items list. For each listed item, the list shall show the potential types of interference that can occur, their impact, and measures planned for security control.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7

1. NUMBER 515/PA2	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Availability Models/Predictions		4. DATE December 21, 1990

5. DESCRIPTION

These are mathematical models of the system that represent an ECS design which meets specified availability goals for the system functions. The modeling shall include the development of reliability block diagrams and shall be performed for each Segment and Element in the ECS and for each operating function of each Element. The models shall be based on allocation of reliability to the functions within the ECS design and shall employ the vendor- provided unit reliability data for the off-the-shelf hardware and derived reliability data for custom designed components making up the system design. While the model shall represent the overall ECS, software "reliability" shall be represented by a reasonable estimate (with supporting rationale), and the tradeoff/allocation activity shall emphasize the hardware reliability and maintainability and include operational considerations. Redundancy decisions and spares provisioning (logistics planning) shall be based on reliability and maintainability analyses .

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7

1. NUMBER 516/PA2	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Reliability Predictions		4. DATE December 21, 1990

5. DESCRIPTION

Reliability predictions are required to support the availability modeling activity. Where vendor-supplied reliability data at the purchased-hardware unit level (or at lower levels of assembly, in selected cases) are not available, or in the case of custom designed hardware, the Contractor shall perform reliability predictions in the following order of priority:

1. Use historical or comparability data for like items using similar technology in similar environments.

2. Use Appendix A of MIL-HDBK-217F, Parts Count Reliability Prediction Methodology.

The predictions shall account for the generic part types, piece parts quality levels, and the equipment environment.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7

1. NUMBER 517/PA2	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Failure Modes and Effect Analyses(FMEA) and Critical Items List (CIL)		4. DATE December 21, 1990

5. DESCRIPTION

This is an analysis of the critical command and control systems of the Flight Operations Segment (FOS) to identify potential catastrophic and critical failures so that susceptibility to the failures and their effects can be eliminated from the ECS. The output of the analysis will include a listing of all failure modes and severity level of the failure effects. The FMEA process shall be performed iteratively, starting early in the design phase, to ensure that the design and changes resulting from design reviews, analyses, waivers or deviations, operations changes, sustaining engineering activity, or other reasons do not introduce unrecognized new failure modes or criticalities into the system.

The FMEA shall be conducted at the equipment level LRU, or equipment level as appropriate for all FOS subsystem functions. Potential subsystem-level catastrophic and critical failure modes shall be analyzed to the extent necessary to identify single LRUs that could cause the failures. CH05

The analysis shall be directed to reveal any single failure points in the FOS components that provide critical real- time functions so that such failure points can be eliminated. Potential catastrophic failures that cannot be eliminated from the system, and all potential critical failures (as defined in the ECS PAR), shall be itemized on a Critical Items List (CIL), attached to the FMEA. Justification for retention of each item listed shall be included.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7

1. NUMBER 518/PA3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Maintainability Predictions		4. DATE December 21, 1990

5. DESCRIPTION

Maintainability predictions shall be made showing the capability of the system/component/LRU to meet the allocated mean time to repair and/or the specified mean down time requirements. The predictions shall be made using MIL-HDBK-472, Prediction Procedure II. The predictions shall identify and document mean-time-to-repair (MTTR) and mean-down-time (MDT) requirements throughout the system, derived from the reliability analyses and tradeoffs. The MTTR requirements shall be broken down to the line replaceable unit (LRU) level to establish requirements for logistics planners. The top level of maintainability requirements shall be allocated to the planned levels of repair.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7

1. NUMBER 519/PA3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Maintainability Demonstration Test Reports		4. DATE December 21, 1990

5. DESCRIPTION

Reports of the results of each of the individual demonstration tests included under the Maintainability Demonstration Plan.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7

1. NUMBER 520/PA2	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Software Critical Items List		4. DATE December 21, 1990

5. DESCRIPTION

These are lists of ECS software Computer Program Configuration Items (CPCIs) that have a critical command, control, or data receiving or storage function, such that a malfunction may result in damage to or loss of the flight hardware or the EOS mission, including the loss of critical science data. These software CPCIs are called "software critical items," and identify those items that require appropriate management attention and safety program actions for each release. Updates are provided as required for any changes related to a release. CH06

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7

1. NUMBER 521/PA3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Software Nonconformance Reports (formal)		4. DATE December 21, 1990

5. DESCRIPTION

A separate report is required for each nonconformance discovered in the software and software documentation.

The nonconformance reporting and corrective action process shall begin with the integration and test phase. Initially a closed-loop system managed by the development activity may be used. Formal reporting of software nonconformances for each software product shall begin with the establishment of its initial product baseline and shall interface with the software configuration management process such that change control is effected, and that reported nonconformances and change requests are so identified and processed.

For formal software nonconformance reporting, an appropriate format shall be used which includes at least the following minimum set of data items:

a. Unique report identification number;

b. Software product identification (including version number);

c. Originator;

d. Origination date;

e. Report title (i.e., very brief description of the discrepancy);

f. Discrepancy summary (fuller description of the discrepancy);

(cont'd)

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7

1. NUMBER 521/PA3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Software Nonconformance Reports (formal)		4. DATE December 21, 1990

5. DESCRIPTION (cont'd)

g. Status (progress toward closure);

h. Discrepancy source (e.g., hardware, firmware, software, etc.);

i. Discrepancy criticality category (see par. 6.4);

j. Proposed corrective action;515/PA1(continuation of) Software Nonconformance Reports (formal) k. Corrective action taken (including version identification of the corrected product and date);

l. Test verification of corrective action (and date);

m. Closure date and authority signature.

The information shall be provided in hard copy and in a computer readable form which shall be as an ASCII file (with hard-copy documentation of file structures and file names). The required medium is flexible disk(s) compatible with IBM-PC DOS or MS DOS. The disks may be (1) 5.25 inch, double- sided, double-density (DS-DD), 360 kilobyte, (2) 5.25 inch high density (HD), 1.2 megabyte, (3) 3.5 inch, DS-DD, 720 kilobyte, or (4) 3.5 inch, HD, 1.4 megabyte.

6. FORMAT

7. DELIVERY

8. TYPE Document	9. SOW REFERENCE 3.7

1. NUMBER 522/PA2	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Integration and Inspection Flow Plan		4. DATE December 21, 1990

5. DESCRIPTION

This is a plan that covers ECS hardware activities from receipt of hardware items through integration, test, and operational use of the system. It shall include the inspection and test points, and Government inspection points.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7

1. NUMBER 523/PA1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Contractor Workmanship Procedures Proposed Instead of NASA NHBs		4. DATE December 21, 1990

5. DESCRIPTION

The requirements of NHB 5300.4(3A), NHB 5300.4(3G), NHB 5300.4(3H), NHB 5300.4(3I), NHB 5300.4(3J), and NHB 5300.4(3K), shall be implemented, as appropriate in procurement, maintenance, and fabrication activities. If the Contractor has, and proposes to use, his existing processes, specifications and/or procedures which implement the above requirements, the Contractor shall submit a comparison matrix for each of the proposed documents, noting deviations from the corresponding NASA documents cited above.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7

1. NUMBER 524/PA1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE New or Critical Processes, Specifications, and/or Procedures		4. DATE December 21, 1990

5. DESCRIPTION

Any processes, specifications, and/or procedures identified as "New" and/or "Critical" (submitted for evaluation of acceptability).

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7

1. NUMBER 525/PA3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Training and Certification Records		4. DATE December 21, 1990

5. DESCRIPTION

Records shall be maintained of the training, testing, certification, and recertification status of personnel performing manufacturing, integration, inspection, operations, and maintenance activities.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7

1. NUMBER 526/PA1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Standard Repair Procedures		4. DATE December 21, 1990

5. DESCRIPTION

These are documented procedures for the repair of hardware defects or damage which tend to recur commonly. They are termed "Standard Repair Procedures".

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7

1. NUMBER 527/PA1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Request for Waiver		4. DATE December 21, 1990

5. DESCRIPTION

Documented Waiver Requests for Contracting Officer approval are required for any MRB-proposed disposition of defective hardware that may adversely affect the safety, reliability, durability, performance, interchangeability, or other basic features of the hardware.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7

1. NUMBER 528/PA1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Request for Delegation of MRB Authority to a Supplier		4. DATE December 21, 1990

5. DESCRIPTION

Where the Contractor proposes to delegate MRB authority to a supplier, documented NASA approval must be obtained.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7

1. NUMBER 529/PA3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Malfunction/Failure Reports (MRs)		4. DATE December 21, 1990

5. DESCRIPTION

A malfunction or failure report (MR) shall be written for any departure from design, performance, testing, or handling requirement that may affect the function of the ECS hardware or compromise mission objectives.

Reporting of ECS hardware failures shall begin with the first power application at the lowest level of assembly or the first operation of a mechanical item;

ECS software nonconformance reporting within this over-all reporting system shall begin when the software is used with the ECS hardware any time after the beginning of the acceptance test activity on the software involved in the malfunction. (See also DID 515/PA1.)

The MR data shall be submitted in hard copy and in a computer readable form which shall be as an ASCII file (with hard-copy documentation of file structures and file names). The required medium is flexible disk(s) compatible with IBM-PC DOS or MS DOS. The disks may be (1) 5.25 inch, double- sided, double-density (DS-DD), 360 kilobyte, (2) 5.25 inch high density (HD), 1.2 megabyte, (3) 3.5 inch, DS-DD, 720 kilobyte, or (4) 3.5 inch, HD, 1.4 megabyte. The hard copy updates shall be made as the updating actions occur on each MR, and the iteration submitted to the GSFC for closure shall include a copy of all referenced data and shall have had all corrective actions accomplished and verified.

The submittal of the data in the above specified computer readable form shall be in monthly composited updates of all currently open malfunction reports (with each data item separately identified to its respective MR). When each MR is closed, the next monthly computer composite shall carry the closure update of all Form 4-2 data on that MR.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7

1. NUMBER 530/PA1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Closeout Submittal of Malfunction/Failure Reports (MRs)		4. DATE December 21, 1990

5. DESCRIPTION

The closure iteration of each MR documents the completion of required closure actions. At this point, the Failure Review Board chairman, denoting approval of the entire Board, shall sign the MR closeout before submitting it for NASA closeout. MRs shall not be considered closed until signed by the authorized Government representative.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7

1. NUMBER 531/PA2	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Spacecraft Orbital Anomaly Report (SOAR)		4. DATE December 21, 1990

5. DESCRIPTION

These document each anomaly occurring on the EOS flight hardware or software during the mission. A SOAR (GSFC Form 4-29) shall be initiated immediately after the anomaly occurs. Within 72 hours of the occurrence, hard copies shall be sent to the EOS Mission Operations Manager (MOM) for appropriate EOS action, follow-up, and closure, and to the GSFC Soar System Manager, Code 302, for further processing and closure under the SOAR system.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7

1. NUMBER 532/PA1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Environmental Control Plan		4. DATE December 21, 1990

5. DESCRIPTION

This documents the plan for implementation of suitable environmental and cleanliness controls for all areas used for the operation, storage, maintenance, repair, inspection, or test of the system equipment. The controls shall be responsive to the requirements and/or recommendations of the system equipment manufacturers and to the need for protecting the system and the software media against contamination, damage or deterioration. Temperature, humidity, and contamination standards, controls, and monitoring requirements and methods shall be stated.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7

1. NUMBER 533/PA1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Responses to Problem Notices and Alerts		4. DATE December 21, 1990

5. DESCRIPTION

These are Contractor responses to specific NASA inquiries in the form of special notices (e.g. NASA TWX alerts) of general problems, or selected Government-Industry Data Exchange Program (GIDEP) Alerts or SAFE-Alerts on specific parts, materials or safety problems. The Contractor shall notify NASA of any of these Alerts or problem notices which have or may have an effect on the ECS hardware and any follow-up action proposed.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7

1. NUMBER 534/PA1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Maintenance Records		4. DATE December 21, 1990

5. DESCRIPTION

During the operational phase, the Contractor shall maintain operational and maintenance records as required by the ECS Maintenance Plan (DID 613/OP3). These data shall be used to support the RMA program (see ¶5.5 of the ECS PAR) and to provide logistics data. The maintenance records shall at least include the following data items:

a. Operating logs for each equipment. Data shall at least include on/off times, operating time, down time for each maintenance/repair event, equipment rack access records (times opened/closed, purpose, identification of individuals), and failure frequency data.

b. Configuration logs for each equipment. Data shall at least include a current configuration list for the equipment, dates and times of equipment or LRU installation and removal, and serial numbers of LRUs removed for repair and for the replacement LRUs.

c. A system of maintenance work orders and fabrication/repair records covering pertinent data, including LRU identification, diagnostic data, repair operations and steps, repair time duration, hardware disposition and routing, spare parts availability (and resupply delays), test procedure for repaired item and test results.

The maintenance records shall be maintained and stored in a readily accessible, identifiable and retrievable form. The records shall be retained at the Contractor's facility or the ECS facility for the duration of the contract. The maintenance records shall be available for NASA inspection at the ECS operations work sites and maintenance sites. Copies of specific documents shall be provided in response to specific NASA requests.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7

1. NUMBER 535/PA1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Acceptance Data Package		4. DATE December 21, 1990

5. DESCRIPTION

An Acceptance Data Package is required prior to submittal of each release of the ECS for GSFC acceptance. The Acceptance Data Package shall include the following information with appropriate approvals:

a. Records of the final system configuration audit, including the As-Built Configuration List of hardware and software (deviations from the as- designed configuration shall be noted);

b. Results of the system acceptance test program;

c. Test log books, including total operating time and cycle records;

d. List of open items with reasons for items being open and appropriate authorization/approvals;

e. Deliverable data, instruction material, and equipment for maintenance and system test;

f. Operating manuals.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.7

1. NUMBER 601/OP1	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE Maintenance and Operations Management Plan		4. DATE December 21, 1990

5. DESCRIPTION

Describes the Contractor's management organization for ECS operations at GSFC and the field offices at each of the other ECS sites. Describes the management system, controls, functions, policies, procedures, and documentation to be utilized in fulfilling the M&O requirements of each site.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.8.1

1. NUMBER 602/OP1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Property Management Plan		4. DATE December 21, 1990

5. DESCRIPTION

Provides for the control of personal property, documenting a continuous audit trail from receipt of an item until transfer of accountability or disposal. This plan describes how to maintain:

a. records of all property;
b. untagged controlled equipment to the NASA Property Administrator;
c. the physical inventory of controlled equipment;
d. monthly transaction reports and quarterly property inventory reports;
e. property forms (identifying transferred, shipped, disposed of, or modified.;
f. identification and reporting equipment no longer required; and
g. continuing surveillance to ensure that equipment is properly used and physically protected.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.8.1.2

1. NUMBER 603/OP1	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE Operational Readiness Plan		4. DATE December 21, 1990

5. DESCRIPTION

Describes the process to assure all elements are in a state of operational readiness at all times, including preparations for mission launches and sustaining levels of performance of all hardware, software, and personnel for which the Contractor has M&O responsibility. Provides for regular monitoring of all M&O activities under the contract. Also includes the Contractor's plan for managing Operational Readiness Reviews.

This document contains the following sections: Staffing Plan Section, Hardware Readiness Section, and Software Readiness Section

The Staffing Plan section shall include:

a. The number and qualifications of the person or persons provided to accomplish each function;
b. The ongoing training to develop and maintain the knowledge, skills, and techniques required by each function;
c. The provisions for maintaining full and efficient operations during any absence of Contractor personnel, including supervisors, shift leaders, and specialists;
d. The regular scheduling of the operation of facilities and equipment individually, and in combination, as elements of subsystems and systems to develop and maintain familiarity and proficiency in tasks and assignments that may occur both, infrequently and frequently in meeting the contract requirements; and
e. The demonstration of knowledge and proficiency by a comprehensive group of tests and exercises that provide a complete and objective measure of operational readiness.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.8.1.5, 3.8.1.5.1, 3.8.1.5.3

1. NUMBER 603/OP1	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE Operational Readiness Plan		4. DATE December 21, 1990

5. DESCRIPTION (cont'd)

The Hardware Readiness section plans and procedures shall include:

a. Current records that indicate the location and status of equipment and inventories;
b. Preventive maintenance procedures and schedules;
c. Reports of problems, malfunctions, or failures, their solutions or corrections, and analysis and projections that may indicate failure-prone components or equipment, or long-term degradation;
d. Failure analysis or malfunction diagnosis procedures that will isolate and identify end-point failures, degradations leading to failures, and probable propagation routes of failures through components or subsystems;
e. Systematic and comprehensive test procedures designed to exercise the system from the smallest subunit individually through the total interconnection of all elements into a complete system, including its human elements, that culminate in a demonstration of total system operational readiness;
f. Contingency provisions to ensure operational readiness during the temporary unavailability, either planned or unplanned, of facilities or equipment.

The Software Readiness section of the plan describes software management and configuration management activities to be performed on all software maintenance tasks, and provides rigorous discipline for deliveries, discrepancy reporting, implementation, and tracking. It contains plans and procedures for assuring the operational readiness of all software delivered by the Contractor and accepted by the IATO and for all externally developed (non ECS) software which has successfully passed operational verification and operational testing.

6. FORMAT

7. DELIVERY

8. TYPE Document	9. SOW REFERENCE 3.8.1.5, 3.8.1.5.1, 3.8.1.5.3

1. NUMBER 604/OP1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE ECS Operations Concept Document		4. DATE May 9, 1995

CH10

5. DESCRIPTION

Provides a description of how the ECS will appear to its users, including the assumptions about how operational tasks will be performed on the systems and how the users will interact with the systems. Describes the relationship of the functions of the ECS to perform operational and user tasks.

Includes scenarios describing system operations and the interaction of major functions of the system. Contains scenarios that reflect the scientific requirements for the ECS by providing representative views of ECS operations.

The Operations Concepts scenarios should flow from a set of high level concepts to release specific detailed scenarios. The OPS Concept document should be published twice each release cycle. Once to support the Release Initiation Review (RIR), and the second to support CDR. For both publications, the primary delivery mechanism would be the EDHS, but a limited number copies would also be delivered. This document has two basic sections. The first section describes the overall high level goals and OPS concepts for the ECS project. The second part of the document has DAAC specific Day in the Life Of..scenarios for the next release that sets the theme, and describes how the requirements for the upcoming release will be satisfied.

Part one of this document, will only change if there is a major change in the project and should remain fairly static across releases. Part two will be release and site specific (for the current release) and make specific references (by name) to detailed scenarios that will eventually be published in the Operations Scenarios document (DID 605) or Software Development Folders. The main difference between the RIR and CDR version of DID 604 will be the references to the more detailed scenarios. The RIR version makes an initial determination of what detailed scenarios need to be written as part of the design cycle, and the CDR version refeences specific scenarios found in DID 605 or Software Development Notebooks. Between RIR and CDR an informal version of DID 604 and DID 605 will be continually maintained as a working notebook.

CH10

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.2.2.3

1. NUMBER 605/OP2	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE Operations Scenarios		4. DATE December 21, 1990

5. DESCRIPTION

The Operations Scenario Document specifies the display formats and operational scenarios that will be implemented in those elements with significant operator/machine interaction.

The document shall describe the various operational scenarios encountered in day-to-day operation of the system. Maximum use of graphics and artist's renderings shall be used for descriptive purposes in sections describing the displays. The document shall include for all elements requiring operator interaction, a minimum of the following information:

a. Complete description of each display including exact screen formats.
b. Operational scenarios for each affected element.
c. Descriptions of typical visual displays the operator will find on the display terminal during specific operations.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.3.2.6

1. NUMBER 607/OP2	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE Maintenance and Operations Manual		4. DATE December 21, 1990

5. DESCRIPTION

Defines maintenance and operations concepts for the system elements and describes how the elements and subsystems will be operated and maintained. Roles and responsibilities of the operations personnel shall be described in enough detail to permit an evaluation of the operational requirements with respect to the individual hardware and software subsystem requirements. Any special maintenance requirements imposed by the hardware and software subsystem requirements analysis shall also be presented.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.8.3.1

1. NUMBER 608/OP1	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE ECS Operations Plan		4. DATE December 21, 1990

5. DESCRIPTION

Provides a description of the way in which the system will appear to its users/operators and the way in which they will interact with the system. Details how operational tasks will be performed on the system. Represents a consensus between development, support, and user groups on the conceptual operation of the overall system. Serves as an information source during design, implementation, and testing of the system.

Includes provisions for software operations and scenarios supporting software operations and the training required. Training plans shall define the function of any necessary training facilities in personnel training and the methods by which newly trained personnel will be phased into system operations with minimum effect on those operations. The Operations Plan shall also include the staffing plans necessary to implement the Contractor's operations concept.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.2.2.3, 3.8.3.1

1. NUMBER 609/OP1	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE Maintenance and Operations Procedures		4. DATE December 21, 1990

5. DESCRIPTION

Provides detailed description of the operations and maintenance procedures for elements and subsystems. Contains complete operations descriptions for the subsystem, including the operating modes, formats, and operator controls and responses for any operator actions. Emphasis is placed on the integrity of the man/machine interaction to accomplish a system operation within operational and environmental constraints. Maintenance procedures are described in similar detail with a step-by-step maintenance plan for each configuration item, specific preventive maintenance frequencies and durations, and identification of unique maintenance procedures.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval. All Schematics Level drawings should be in accordance with 500-TIP-3109 and X-673-64-1D.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.3.2.6

1. NUMBER 611/OP3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies each manual
3. TITLE Operator's Manuals		4. DATE December 21, 1990

5. DESCRIPTION

Provides procedures and information for operating each system element/subsystem and for maintaining a state of readiness to perform the subsystem functions. A manual is to be developed for each of the ECS elements.

Operations Manuals shall be prepared and maintained for all ECS equipment and elements requiring operator interaction. The manuals shall contain the procedures and information necessary to initiate, operate, and monitor the equipment.

6. FORMAT

The operator's manuals should be in accordance with 500-TIP-2111.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.8.3.1

1. NUMBER 612/OP3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies each manual
3. TITLE Programmer's Manuals		4. DATE December 21, 1990

5. DESCRIPTION

Describes programming aspects of the element computers in sufficient detail to support software sustaining engineering. Describes the programming aspects of a computer in sufficient detail to enable a programmer to produce computer software and to interpret, checkout, troubleshoot, or modify an existing program. Applicable to all equipment configurations in which the software can be run. Describes a specific computer and its operation from a programmer's point of view.

The Programmer's Manual provides information to enable a programmer to:

a. produce software in assembly language, machine language, or a higher order language,
b. interpret, checkout, troubleshoot, or modify existing software,
c. use ECS developed system software, and
d. use software libraries.

The Programmer's Manual is developed for specific host computer(s).

The format of this document shall be compatible with the requirements of the NASA Integrated Automated Document Program.

If the content of this document is available commercially, the Contractor may, with NASA approval, substitute the commercially available document for this document.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.8.3.1

1. NUMBER 613/OP1	DATA ITEM DESCRIPTION	2. QUANTITY 25copies each plan
3. TITLE COTS Maintenance Plan		4. DATE December 21, 1990

5. DESCRIPTION

Describes policies and procedures to be applied to maintenance of all COTS hardware and software for which the Contractor has M&O responsibility. Delineates the preventive maintenance (PM) for all systems/equipment and provides a means for scheduling its accomplishment; provides a system of records to document all maintenance, including both PM and corrective maintenance, as well as modifications; specifies reports to be provided; provides procedures for configuration control; specifies training requirements and schedules; and defines policies and procedures for maintaining visibility and control of system problems using discrepancy reports or similar mechanisms.

Procedures for maintenance of hardware or software include the following:

- discrepancy reports (DRs);
- investigation of anomalies and inefficiencies;
- operational work around;
- presentations to the Configuration Management Board;
- implementation of modifications to hardware or source code, operational procedures, user documentation, engineering diagrams, and programmer documentation as appropriate;
- test plan and test procedures for the system modification;
- DR resolution, modified documentation, test plan and procedure and the test results to the CCB and to the IATO for acceptance testing prior to installation;
- installation of the DR resolution after acceptance by the IATO and the CMB;
- notification of operational personnel and affected users of the DR resolution and installation schedule prior to installation.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.8.3.2

1. NUMBER 614/OP1	DATA ITEM DESCRIPTION	2. QUANTITY 100 copies
3. TITLE Developed Software Maintenance Plan		4. DATE December 21, 1990

5. DESCRIPTION

Specifies the policies and procedures for the maintenance of developed software.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.8.3.2.3

1. NUMBER 615/OP2	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Special Maintenance and Test Equipment		4. DATE December 21, 1990

5. DESCRIPTION

Contains documentation about the special maintenance and test equipment which has been approved by the Government. This documentation consists of items such as user's manuals and maintenance documents. For commercially purchased test equipment this consists of the vendor documentation.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.8.3.2.2

1. NUMBER 616/OP2	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Integrated Logistics Support Plan		4. DATE December 21, 1990

5. DESCRIPTION

Describes the programmatic and management structure, the management tools (planning, controls and information system) and the reporting to be used by the Contractor in the implementation, integration, and execution of the ECS Integrated Logistics Support (ILS) program.

Identifies the ILS oriented reports and manuals to be developed. Covers all ILS for ground system installation, testing, and operations.

The ILS mission is to identify resources and facilities needed to achieve and maintain the operational availability requirements of ECS which relate to logistics support. The Contractor shall establish an ILS program to minimize life cycle cost. In the fulfillment of this effort, the Contractor shall provide the capability for problem definition and resolution, data analysis, logistic support engineering analysis, on-site and off-site field support, overhaul, operation and maintenance documentation, supply support, packaging, handling, and transportation support, standardization and training. This plan shall include but not be limited to:

a. A brief description of the ILS objectives and their relationships to major program requirements;
b. A description of the organization planned for management of the ILS program, and the internal interfaces between the ILS organization and other elements of the Contractor's organization, as well as with Goddard Space Flight Center's organizational interfaces;
c. The resources required by the Contractor at the ECS site.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.8.2

1. NUMBER 617/OP3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Logistics Support Analysis Plan		4. DATE December 21, 1990

5. DESCRIPTION

Provides logistics support analysis for the ECS to determine and evaluate the logistics support required for the system. These analyses, in accordance with the Integrated Logistics Support Plan, shall include:

a. Maintenance Analysis;
b. Level of Repair Analysis (LORA);
c. System Assembly and Checkout Technical Analysis;
d. Test Planning Analysis;
e. Operational Requirements Analysis;
f. Packaging, Handling, Storage, and Transportation (PHS&T);
g. Logistics Support Analysis;
h. Logistics Budget;
i. Support Equipment Analysis.

These analyses shall address all applicable levels of maintenance for the ground station. The analyses shall provide inputs that ensure adequate resources (including facilities) are available to support all levels of maintenance.

These analyses shall provide source data for development of the operation and maintenance technical data, define activities related to the operation of the system, and record the requirements necessary to operate ECS elements.

These analyses shall establish the contents, format, maintenance, and submittal requirements for the resupply analysis.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.8.2

1. NUMBER 617/OP3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Logistics Support Analysis Plan		4. DATE December 21, 1990

5. DESCRIPTION (cont'd)

Logistic Support Analyses (LSA) shall be conducted on both the system level and the equipment level, and on items required to support the ECS. LSA candidate items will be determined by the Contractor in coordination with the Government. Additional items may be provided by the Government.

These analyses shall establish a detailed logistics budget by line item for ECS hardware/software, support equipment, facilities, documentation, etc.

These analyses shall establish a LORA which shall form the basis for a recommended repair level; repair vs. discard-at-failure decision, spares provisioning, and maintenance planning.

6. FORMAT

7. DELIVERY

8. TYPE Document	9. SOW REFERENCE 3.8.2

1. NUMBER 618/OP3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Replacement Parts List and Spare Parts List		4. DATE December 21, 1990

5. DESCRIPTION

Identifies replacement parts and procurement sources for these parts. The replacement parts list shall also identify the spare parts required to support the ECS system through the required period of performance. Contents of the list are specified in GSFC Specification for Ground System Spare Parts Program, S-530-1.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.8.2

1. NUMBER 619/OP3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Test and Support Equipment Requirements List		4. DATE December 21, 1990

5. DESCRIPTION

Establishes the test and support equipment necessary to support the maintenance of the ECS. Excludes built-in test equipment (BITE). Identifies the intended use and application for the equipment. Contains the following information:

a. Type of instrument or device;
b. Measurement range or performance range;
c. Make and model;
d. Optional features;
e. Special cables, connectors, probes, and adapters;
f. Catalog cost or estimated cost;
g. Quantity required;
h. Date required;
i. Special or general purpose test equipment designation.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.8.2

1. NUMBER 621/OP1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE M&O Transition and Training Plan		4. DATE December 21, 1990

5. DESCRIPTION

Describes the transition of maintenance and operations to the permanent or follow-on maintenance and operations organization(s) and/or their contractor(s).

6. FORMAT

Contractor format should be in accordance with Contractor Provided Training Specification 535-TIP-CPT-001 and 500-TIP-2110 standards. Contractor format acceptable with approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.8.3

1. NUMBER 622/OP2	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE ECS Training Plan		4. DATE December 21, 1990

5. DESCRIPTION

Defines the training required to prepare personnel to operate, maintain and utilize the ECS in support of EOS missions. Describes the organization, facilities, equipment, methodology, requirements analysis, staffing, curriculum and schedule for Contractor training of EOS management, investigator, technical, operations and maintenance personnel. Includes subcontractor provided training as applicable. The training methodology shall include, but not be limited to, computer assisted instruction, classroom training, supervised on-the-job training and audiovisual aids including video tape presentations by the subject matter experts. The Plan shall also include trainee test and certification procedures.

Includes course descriptions providing an overview of the training courses covering, as a minimum, all elements of the system, subsystems, orientation guides, maintenance and other specific courseware. Includes a course schedule and a matrix of courses with prerequisites and associated qualifications.

The training plan shall contain, as a minimum, the following information:

a. Training organization and responsibilities;
b. Necessary Contractor and Government training facilities;
c. A description of the overall training approach whether formal, informal self study or on-the-job type training;
d. A training objectives versus training resources requirements matrix which identifies instructor staffing and shows unique training provisions or equipments;
e. The knowledge, skills, prerequisites and proficiency levels required of each statement;
f. A detailed training schedule;
g. Test and certification procedures. (Note: Forms part of certification plan.)

6. FORMAT

The training plan shall be prepared in accordance with the Contractor Provided Training Specification 535-TIP-CPT-001.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.8.3.4.2, 3.2.2.3

1. NUMBER 625/OP3	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE Training Material		4. DATE December 21, 1990

5. DESCRIPTION

All training materials shall be furnished under this data item. Course material shall be modularized, individualized, and use multi-media learning resources. These materials shall consist of visual and instructional material for all areas of system operations, maintenance and enhancement. Training materials shall support the training of operations and maintenance personnel. Identifies training materials and equipment including the following, as a minimum:

a. Job task schedule;
b. Screening test;
c. Instructor handbook;
d. Textbook;
e. Display book;
f. Student workbook;
g. Academic and performance tests;
h. Training aids;
i. Interactive Courseware (computer based training)/software/equipment;
j. Simulation Courseware/software/equipment;
k. Certification/Skills catalog.

6. FORMAT

Contractor format should be in accordance with Document Format Specification 500-TIP-2110 standards or Contractor format acceptable with approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.8.3.4.2

1. NUMBER 626/OP1	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE M & O Certification Plan		4. DATE December 21, 1990

5. DESCRIPTION

Includes the procedures and examinations which will be required to achieve certification for each operations or maintenance position. The following items are part of the Certification Plan:

- Development of the certification program (positions for which certification is required, experience, training, and operational proficiency required for each position, Government approval)
- Administration of the certification program (certification records, changes and skills maintenance)
- Interface with non-ECS EOSDIS Elements concerning curriculum scheduling, student registration, and training requirements.
- Training Staff Requirements, such as :
  - Present and future training requirements analysis
  - Training cost effectiveness.
  - Criticality of equipment/systems in support of ECS operations.
  - Selection of training methodologies (e.g., formal, OJT, vendor, etc.)
  - Periodic evaluation of current training curriculum reassigning ECS formal training courses to OJT or self-study where appropriate.
  - Additional training requirements to operate and maintain new or modified equipment/systems in support of ECS operations, and to ensure operational proficiency is maintained.

Note: GSFC Contractor Provided Training Specification 535-TIP-CPT-001 and NMOS Certification Program 500-1002 are recommended for use as a guideline in the preparation of an overall certification plan.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Neutral File Format; Approved electronic media.

8. TYPE Presentation	9. SOW REFERENCE 3.8.3.4.1

1. NUMBER 627/OP3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies
3. TITLE Security Risk Management Plan		4. DATE May 9, 1994

5. DESCRIPTION

Periodic risk analysis must be conducted for new and existing data processing installations to assure that appropriate, cost-effective protective measures are incorporated and are commensurate with the sensitivity, criticality, and value of the associated computer systems, computer applications, and information processed. As part of the risk assessment process is described in paragraph 303 of NHB 2410.9A, NASA Automated Information Security Handbook, June 1993, it may be necessary to recommend actions as the result of the Security Risk Assessment Report (DID 215/SE3). The Security Risk Management Plan documents any actions required from Security Risk Analysis Report (DID 215/SE3).

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Approved processing tools; Approved electronic media.

8. TYPE Document	9. SOW REFERENCE 3.2.4

1. NUMBER 701/PP3	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE PMR Presentation Package		4. DATE December 21, 1990

5. DESCRIPTION

Contains a hardcopy of all material presented during the review plus minutes, action items, and an attendance list.

Two packages shall be prepared: One prior to the review containing presentation viewgraphs and back-up materials and the second after the review containing updated/corrected viewgraphs, action items, Review minutes, attendance, action responses (if available), and schedule of resolution of remainder of action items.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Electronic version not required.

8. TYPE Presentation	9. SOW REFERENCE N/A

1. NUMBER 702/PP3	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE SRR Presentation Package		4. DATE December 21, 1990

5. DESCRIPTION

Contains a hardcopy of all material presented during the review plus minutes, action items and an attendance list.

Two packages shall be prepared: One prior to the review containing presentation viewgraphs and back-up materials and the second after the review containing updated/corrected viewgraphs, action items, Review minutes, attendance, action responses (if available), and schedule of resolution of remainder of action items.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Electronic version not required.

8. TYPE Presentation	9. SOW REFERENCE N/A

1. NUMBER 703/PP3	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE SDR Presentation Package		4. DATE December 21, 1990

5. DESCRIPTION

Contains a hardcopy of all material presented during the review plus minutes, action items, and an attendance list.

Two packages shall be prepared: One prior to the review containing presentation viewgraphs and back-up materials and the second after the review containing updated/corrected viewgraphs, action items, Review minutes, attendance, action responses (if available), and schedule of resolution of remainder of action items.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Electronic version not required.

8. TYPE Presentation	9. SOW REFERENCE N/A

1. NUMBER 704/PP3	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE RRR Presentation Package		4. DATE December 14,1990

5. DESCRIPTION

Contains a hardcopy of all material presented during the review plus minutes and an attendance list.

Two packages shall be prepared: One prior to the review containing presentation viewgraphs and back-up materials and the second after the review containing updated/corrected viewgraphs, action items, Review minutes, attendance, action responses (if available), and schedule of resolution of remainder of action items.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Electronic version not required.

8. TYPE Presentation	9. SOW REFERENCE N/A

1. NUMBER 705/PP3	DATA ITEM DESCRIPTION	2. QUANTITY 25* copies
3. TITLE PDR/IDR Presentation Package		4. DATE December 21, 1990

5. DESCRIPTION

Contains a hardcopy of all material presented during the review plus minutes and an attendance list.

Two packages shall be prepared: One prior to the review containing presentation viewgraphs and back-up materials and the second after the review containing updated/corrected viewgraphs, action items, review minutes, attendance, action responses (if available), and schedule of resolution of remainder of action items.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Electronic version not required.

8. TYPE Presentation	9. SOW REFERENCE N/A

1. NUMBER 706/PP3	DATA ITEM DESCRIPTION	2. QUANTITY 25* copies
3. TITLE CDR Presentation Package		4. DATE December 21, 1990

5. DESCRIPTION

Contains a hardcopy of all material presented during the review plus minutes and an attendance list.

Two packages shall be prepared: One prior to the review containing presentation viewgraphs and back-up materials and the second after the review containing updated/corrected viewgraphs, action items, review minutes, attendance, action responses (if available), and schedule of resolution of remainder of action items.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Electronic version not required.

8. TYPE Presentation	9. SOW REFERENCE N/A

1. NUMBER 707/PP3	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE PRR Presentation Package		4. DATE December 21, 1990

5. DESCRIPTION

Contains a hardcopy of all material presented during the review plus minutes and an attendance list.

Two packages shall be prepared: One prior to the review containing presentation viewgraphs and back-up materials and the second after the review containing updated/corrected viewgraphs, action items, review minutes, attendance, action responses (if available), and schedule of resolution of remainder of action items.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Electronic version not required.

8. TYPE Presentation	9. SOW REFERENCE N/A

1. NUMBER 708/PP3	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE ORR Presentation Package		4. DATE December 21, 1990

5. DESCRIPTION

Contains a hardcopy of all material presented during the review plus minutes and an attendance list.

Two packages shall be prepared: One prior to the review containing presentation viewgraphs and back-up materials and the second after the review containing updated/corrected viewgraphs, action items, review minutes, attendance, action responses (if available), and schedule of resolution of remainder of action items.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Electronic version not required.

8. TYPE Presentation	9. SOW REFERENCE N/A

1. NUMBER 709/PP3	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE TRR Presentation Package		4. DATE December 21, 1990

5. DESCRIPTION

Contains a hardcopy of all material presented during the Test Readiness Reviews plus minutes and an attendance list.

Two packages shall be prepared: One prior to the review containing presentation viewgraphs and back-up materials and the second after the review containing updated/corrected viewgraphs, action items, review minutes, attendance, action responses (if available), and schedule of resolution of remainder of action items.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Electronic version not required.

8. TYPE Presentation	9. SOW REFERENCE N/A

1. NUMBER 710/PP3	DATA ITEM DESCRIPTION	2. QUANTITY 200 copies
3. TITLE ETR Presentation Package		4. DATE December 21, 1990

5. DESCRIPTION

Contains a hardcopy of all material presented during the Element Test Reviews plus minutes and an attendance list.

Two packages shall be prepared: One prior to the review containing presentation viewgraphs and back-up materials and the second after the review containing updated/corrected viewgraphs, action items, review minutes, attendance, action responses (if available), and schedule of resolution of remainder of action items.

6. FORMAT

As required by Specification for Document Formats, 500-TIP-2110. Alternative format specifications require government review and approval.

7. DELIVERY

Electronic version not required.

8. TYPE Presentation	9. SOW REFERENCE N/A

1. NUMBER 714/PP3	DATA ITEM DESCRIPTION	2. QUANTITY 25 copies each package	CH11
3. TITLE Consent to Ship Review Presentation Pkg.		4. DATE August 1995	CH11

5. DESCRIPTION

Contains a hardcopy of all material presented during the review plus minutes, action items and an attendance list.

Two packages shall be prepared: one prior to the review containing presentation viewgraphs and back-up materials and the second after the review containing updated/corrected viewgraphs, action items, review minutes, attendance, action responses (if available), and schedule of resolution of remainder of action items. CH11

7. DELIVERY

Electronic version not required.

8. TYPE Presentation	9. SOW REFERENCE N/A